

In the Lab: Gaming GPUs

**HUB**

# The Computer Paper

May 2008

Volume 21 Number 05

Free

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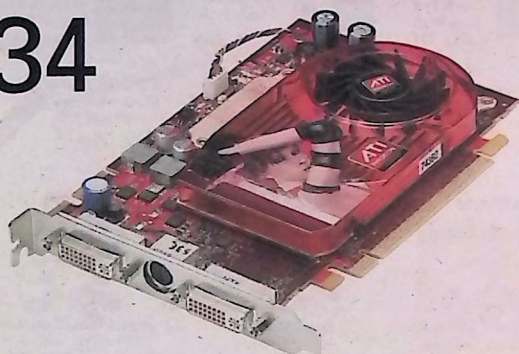
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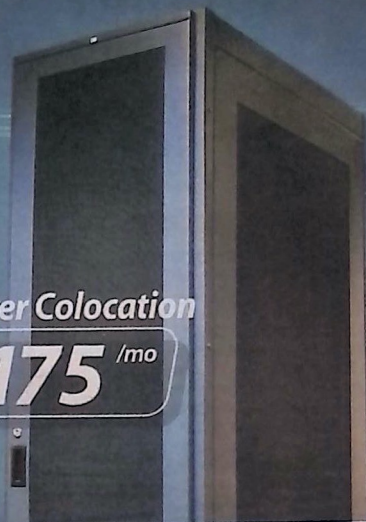
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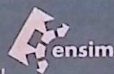
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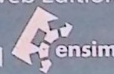
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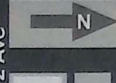
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9 Pin Serial Cable 6 FT Extension F/M	9.99
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Digital KVM Switch HotKey w/cable 2/4port	39/79
EUSSO UKS8204-DO 4 port USB KVM Switch	129
EUSSO UKS8104-RO 4 port KVM Stackable	139
USB Printer connect to Parallel port adapter	29
VIA Chipset S-ATA & ATA PCI Adapter w/ RAID support	29
ST Lab S-ATA PCI Adapter w/RAID support	29

## UPGRADE SPECIAL \$88.99

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## CASE/OTHER

18" Case USB2.0 front 35w/45w Dual Fan	\$29/48
Sony 1.44M Floppy Drive	14
Power supply AT/ATX/450w	29/24.9/39
Dual Fan Power supply 450W	44
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Antec BP-500U Ultra quiet 500W Power supply	79.99
Antec True 380W Quiet Power Supply	59
Cooler Master 650W Power Supply	99.9
Tisonic ATX-460-102DF 460W Quiet Power Supply	69
Tisonic ATX-410-1020DF 410W Quiet Power Supply	48.9
Enemax Liberty LT620AWT 620W Power Supply	179
Enemax Noisetake EG495P-SE SFMA 485W	99
OCZ OC2600XS 600W Silent Power Supply	109
OCZ OCZ 700GXSSLI 700W Silent Power Supply	159
Thermaltake W0117 Toughpower 750W P. Supply	199
Thermaltake TR2-430W Power supply	59
Belkin UPS w/software 425/550/650VA	59/75/89

## CD/DVD-ROM/RW

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LG GSA-H20L 16xDVD±RW BLU-RAY & HD DVD Reader	178.9
LG GH20LS10 20xDVD±RW Lightscribe/SATA w/software	34.9
LG GH20NS10 20xDVD±RW Dual layer SATA w/software	28.9
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Liteon DX-401S Blue-Ray Reader S-ATA	154.99
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Pioneer DVR-212D SATA 18xDVD±RW D.L. W/software	29.9
Pioneer DVR-115D dual layer 20xDVD±RW w/software	29.9
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## CPU/MEMORY

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AMD Sempron64 Am2 LE1150(2.0G)	\$44.9
AMD Athlon64x2 Dual-core 4200/4600/4800	69.9/74.9/89.9
AMD Athlon64x2 5200/5600/6000/6400	114.9/138.9/168.9/179
AMD Phenon Quad Core 9500/9600	212.9/235.9
Intel Celeron-S775 3.33G/3.46G	59.9/69.9
Intel Celeron Dual Core E1200(2x1.6G)	59.9
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Intel Core 2 Duo 4500/4600(2x2.4G)	132.9/135.9
Intel Core 2 Duo E6550(2x2.33G)	178.9
Intel Core 2 Duo E8400(2x3.0G 6M L2 Cache)	219.99
Intel Core 2 Quad Q6600(4x2.4G)/Q9450(4x2.66G)	249.9/389.9
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Canon SD750/SD850is/SD870is	279.9/329.9/334.9
Canon SD1000/SD1500/SD950is/G9	224.9/379.9/424.9/514.9
Canon Camcorder DC210/DC50/ZR950	369/699.9/930.9
Canon camcorder HV10/HR10/HG10	1139/1099/1019
Casio EX-S880/EX-T77/Z1080	269.9/198.9/269.9
Casio EX-Z1200/EX-V8	358.9/299.9
Olympus FE310/FE340/FE350	149.9/198.9/248.9
Olympus S820/S850/S1200/SP560	288.9/288.9/329.9/379.9
Olympus E410/E410K2/E510K	459/699.9/639
Sony DSCS750/DSCW55/DSCW120	179.9/189/219.9
Sony DSCH7/DSCW35/DSCN2	369.9/189.9/369
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Aopen 56K Data/Fax v.90 PCI Modem	\$19.9
Conexant 56K Data/Fax v.90 PCI Modem	18.9



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AMD Athlon64 X2	5200+/5600+	\$539/559
AMD Athlon64 X2	6000+/6400+	\$589/609

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VIA DeltaChrome Video Card O/B  
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17" P4-ATX USB2.0-Front Case  
10/100Mb Ethernet O/B  
Speakers w/Headphone Jack  
19" LG L196WWTY Wide Screen LCD  
(1440x900 2ms, 3000:1, Dual Analog/Digital)

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AMD Sempron64	LE1200(2.1G)	\$509
AMD Athlon64 X2	4600+/4800+	\$549/569
AMD Athlon64 X2	5200+/5600+	\$599/619
AMD Athlon64 X2	6000+/6400+	\$649/669

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250GB SATA2 8M cache hard drive  
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LG H55N 20xDVD±RW Dual Layer Drive  
6 Channel 5.1 Sound Card O/B  
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(Keyboard + Optical Wheel Mouse)  
17" P4-ATX USB2.0-Front Case  
Gigabit Ethernet & 1394 Firewire O/B  
Speakers w/Headphone Jack  
19" LG L196WWTY Wide Screen LCD  
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LG H55N 20xDVD±RW Dual Layer Drive  
6 Channel 5.1 Sound Card O/B  
Logitech Deluxe 250 desktop combo  
(Keyboard + Optical Wheel Mouse)  
17" P4-ATX USB2.0-Front Case  
10/100Mb Ethernet O/B  
Vibe 2.1 Speakers w/ Subwoofer  
19" LG L196WWTY Wide Screen LCD  
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AMD Athlon64 X2	4600+/4800+	\$829/849
AMD Athlon64 X2	5200+/5600+	\$879/899
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Phenon Quad-Core	9500/9600	\$979/1009

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2.0G DDR2-800 Dual Channel RAM  
500GB 7200RPM SATA2 16MB Hard Drive  
All-In-One Memory Card Reader  
nVidia GF9600GT Video Card w/512M/DVI  
LG H55N 20xDVD±RW Dual Layer Drive  
8-Channel 7.1 Sound Card O/B  
Logitech Deluxe 250 desktop combo  
(Keyboard + Optical Wheel Mouse)  
17" P4-ATX USB2.0-Front Case  
10/100/1000Mb Gigabit Ethernet O/B  
Altec Lansing VS3251 5.1 Speakers w/Remote  
19" LG L196WWTY Wide Screen LCD  
(1440x900 2ms, 3000:1, Dual Analog/Digital)

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## MOTHERBOARD

ASUS M2A-VM-B/M2A-VM	\$74.9/76.9
ASUS M2A-VM-HDMI-M2N-E	87.9/109.9
ASUS (AM2) M2NE-SLI/M2N-LR	99.9/236.9
ASUS (AM2) M2N-MX SE/M2N-MX SE Plus	64.9/66.9
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ASUS M2V-MX SE/M2N32-SLI-WF	59.9/189.9
ASUS M2N32-WS-Pro/M2R32-MVP	219.9/124.9
ASUS M3A/M3A32-MVP-Deluxe	99.9/204.9
ASUS M3A78-EMH	99.99
Asus Intel X38 Chipset Maximus-Form/EXT	269.9/359.9
ASUS P5SD2-X/P5VD2-MX-SE/P5B-Premium	69.9/69.9/219.9
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ASUS Striker NF680i/Striker! NF780i	309.9/319.9
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Foxconn 45CMX	59.9
PC Partner 915PAST-A47 i915 chipset Firewall	79
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Gigabyte GAP35-DS3R	159.9
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MSI P35-NEO-F/965 Platinum	125/159.9
MSI K9N-Diamond/K9N-SLI-Platinum	199/145

## MONITOR

Acer LCD 17" AL1716FB/AL1717FBD	\$165.9/189.9
Acer 19" LCD X193WB/20" X203WB	189.9/205.9
Acer 20" Ferrari F20 800:1 8ms DVI w/speaker	449.9
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Acer 24" X243WBD/26" X263WBD	369.9/449.9
Acer LCD TV 32" AT3220A 1366x768 8ms DV	644.9
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LG 17" L1753TX 2000:1 5ms Analog/DVI	194.9
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ViewSonic 17" VA1703WB/19" VA1903WB	188.9/209.9
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Canon MFC-1402/1502/830/960	99.9/109.9/184.9/299.9/389.9
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Brother Laser HL-2030/2040	69.9/89.9
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SamsungG Toner Drum SCX4521D3	69

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Norton Antivirus 2008	19.99
Norton Internet Security 2008	29.99
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PowerData PCI Sound Card 3.1/5.1	\$14/16
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Creative SB Audigy SE 7.1	29.9
Creative SB X-Fi Xtreme Sound	49.9
Creative SB X-Fi Xtreme Audio retail box	69.9
Creative SB X-Fi Xtreme Gamer	95.99
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Vibe 2.1 Speaker with subwoofer/2 pc Speaker	11.9/6
Altec Lansing VS3251 5.1 Spk. w/remote	58.9
Altec Lansing FX4021/FX5051/FX6021	129/219/215
Logitech Z5500	299.9
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Western Digital 80G 7200 RPM IDE(PATA) Hard Drive	\$42.99
IDE (Parallel-ATA) 7200RPM Hard drive with 8MB buffer cache:	
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WD Raptor 10000rpm 74/150G	148.9/184.9
Seagate Cheetah ST314685SS 147G 15000rpm SAS	269.9

## VIDEO

Asus PCI-E 256M EAH 2400Pro/2600Pro	\$49.9/84.9
Asus PCI-E EAH3850 256M/512M	164.9/169.9
Asus PCI-E EAH3870 w/512M/HTDP/DVI/TV-out	199.9
Asus PCI-E EAH3870x2 1.0G	429.9
Asus EN8800GT 512M	218.9
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ATI X1650Pro TV-out DVI PCI-E 512M	69.9
ATI X1650Pro AGP TV-out DVI 256/512M	84.9/89.9
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ATI AGP 8X HD3850 512M DDR3 DVI	199.9
ATI X1950GT PCI-E 512M DDR3 DVI	158.9
ATI X1950Pro Dual GPU 1.0G DVI	249.9
ATI HD2600Pro PCI-E DVI w/audio 512M	84.9
ATI HD2600XT PCI-E DVI w/audio 256/512M	89.9/99.9
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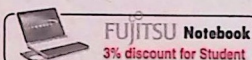
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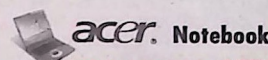
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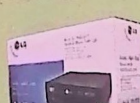
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Welcome to the gaming issue of HUB: The Computer Paper. This month, we're dedicating a majority of our pages to everything related to PC games.

We've got the hardware: Mike Palermo takes a close look at mid-range graphics cards that provide a good balance of price vs. performance, reporting the results of his benchmarking tests and relating their performance in the Lab to their performance with today's top games. In addition, Gord Goble gets up close and personal with several gaming keyboards in the first part of a gaming peripherals series. He risked serious carpal tunnel syndrome putting the boards through their gaming paces and in the process, discovers that some of the boards would be ideally suited for non-gaming applications too and may fit the bill as your primary computer keyboard.

We've got the software: Chad Sapieha got Philippe Therien of Ubisoft Montreal to talk about his experience as a game developer on some top-notch Ubisoft game titles and specifically, about the development process for Tom Clancy's Rainbow Six Vegas 2. What starts out as literally all fun and games morphs in to an around the clock marathon; it's an interesting contrast in what for many gamers, would seem to be a dream job. The moral of the story though, as is often the case when game developers speak, is that creating interactive entertainment is a good sight better than a lot of other desk work.

This month, we also introduce you to the Ultimate Gaming PC. Over the next three issues, we'll be assembling a game playing behemoth. The ultimate goal is to be able to play EA's Crysis at full resolution with all of the graphical bells and whistles maxed. It's no mean feat; a lot of systems still have a hard time in taming this cutting-edge beast. In the course of the next few issues, we'll put together the parts and power up our Ultimate Game PC just in time to report the results and then... give the system away. As much as it will pain us to part with this PC powerhouse, that's just the kind of love we have for you, our loyal readers. Check online at [www.hubcanada.com](http://www.hubcanada.com) to enter for a chance to win the Ultimate Game PC, courtesy of your friendly neighbourhood HUB: TCP writers and editors and the companies who have graciously provided us with all the parts we need to get this project off the ground.

Building a PC from the ground up can be an intimidating proposition. It's not as difficult as we may sometimes think though. The benefits of doing a start-from-scratch PC build is that you are afforded complete control over which parts and components you use, how the PC case looks and its form factor, how much RAM,

the processor brand, clock speed and number of processing cores, the hard drive brand, size and speed, the video card, the sound card, even the motherboard, case and how the machine and its components are cooled. The downside is all the research to find out if all your components are going to play nicely together.

One of my hobbies is homebrewing beer. Bear with me; it relates. It's a fascinating subject to delve in to if you're interested in that type of thing and if you do it right, the net result is several dozen bottles of your own beer chilling in the fridge, offered up to friends and enjoyed whenever. It's not that complicated but there is quite a lot to learn at first. There are also many stages and levels of homebrewing from purchasing an all-in-one kit through sourcing, milling, mixing and extracting your own malted grain. That's where the local homebrew supply shop comes in. Here, people who've gone through the whole process probably more times than they can count will happily help budding brewers offering up tips, talking through problems, picking out the right products and just generally offering up the benefit of their years of experience and extensive research in to the subject have taught them.

The same goes for computers. You can opt for an all-in-one machine where all you need to do is plug it in and go, you can opt to build it entirely from scratch or you can shoot for halfway in between and customize a pre-configured system, upgrading the components that are important to you. And then there's the boutique PC shops selling the components you need to build your own PC. These shop owners and staff have been through the PC building process many times before. They keep up to date on the latest PC related news and products, they know what works with what and how best to put it all together. They stock the components you need to build your own PC and will often happily share the benefit of their years of experience and subsequent wisdom. In short, if you're building your own rig — Ultimate Game PC or otherwise — you would do well to seek out a boutique PC shop to help you in the process.

Taking the DIY route with your next computer also gives the benefit of learning; the next time your PC is due for an upgrade, you can research and source the components you need to do the best possible job with the least possible cash outlay, install it yourself and learn more in the process.

Or, you could just enter our Win the Ultimate Game PC contest and keep your fingers crossed...

Enjoy the issue,  
Andrew Moore-Crispin

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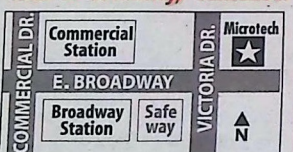
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# DV Or Not DV Another New Future for Digital Video

*3D coming soon to a theatre near you*

"Look out!" "Duck!" "Get out of the way!"

Maybe you already scream at your television set. There's always something on TV these days to get someone engaged, emotional, angry or upset.

Perhaps you yell at non-ideal Idols. Maybe you scream at some Survivors. But when you find yourself yelling at your couch-mate, screaming at them to get down before they get hit, well, then you know you're watching the newest wave in digital video — 3D!

Three-dimensional imagery presented on a two-dimensional screen, be it theatrical or television, has been a holy grail of the production industry for a long, long time. But the technology has progressed far beyond those old stereoscopic viewers that you held a foot or so in front of your face — and it has come a long way from the goofy red-and-green glasses that used to be handed out to sci-fi fanatics in movie theatres in the '50s.

Today, remarkably realistic three dimensional imagery is almost mainstream. Some of the latest and hottest blockbuster titles for rock'n'rollers, tween-age females, dedicated hoops fans, sci-fi enthusiasts and more are driving ticket sales and topping audience satisfaction surveys.

It's not just the continuous development of new digital media techniques and technologies, but people's ability to learn and master new talents and skills that is behind — and in front — of 3D image production.

One key technology being used by many 3D content creators today is the 3D HD Fusion camera system, developed by independent cinematographer Vincent Pace and backed by film director James Cameron (Titanic director Cameron has already completed several large-format (IMAX) films using the system, and is working on the 3D version of Journey to the Center of the Earth, which should hit theatres in 2008).

Each camera system is worth between \$1.5 million

\$2 million, and each integrates two of the highest quality HD cameras available.

The cameras are integrated onto a single sled platform mount, and they are operated and controlled as one. The two cameras track depth in relation to a given subject to simulate what the human eye does, a process various known as dynamic convergence, parallax vision, and/or visual convergence.

Putting high end HD cameras on the system makes perfect sense, but other cameras can be used (opening the door for more accessible independent, even consumer production, of 3D video at some point in the future).

Once the footage is shot, newly-developed computer-based software tools allow for minute adjustments of the dual images, so that they can be mapped together in a fully realistic 3D manner. The tools allow for complete control over depth perception, image convergence and alignment, colorization, exposure and other picture parameters.

In the end, it's the display or projection of the two camera signals, fed simultaneously onto one screen, that produces a 3D experience. Each image is offset slightly by means of polarization filtering on the projector, and then re-united in the third dimension when viewed.

Yes, there are still glasses to be worn, but in recent demonstrations held across Canada to show off the system, audience members were asked to don simple and lightweight polarizing glasses, not huge or heavy mechanical units.

In the meantime, movies like Hannah Montana and U2 are excellent demonstrations of what the technology can do to enhance live events, like music concerts. Equally remarkable is what 3D can do for sports programming.

In one of its earlier demonstrations, the 3D

technology was tested during NBA basketball games and playoff matches. In one case, a private screening was set up to view the results, but later on, public screenings were set-up in movie theaters capable of digital cinema projection.

At the time there were only 50 such theatres in the U.S., but there are several hundred today, spread across the U.S. and Canada. Several digital cinemas are also capable of displaying live HD content via satellite broadcast, so the delivery of 3D HD sports programming to audiences through North America is growing by leaps and bounds.

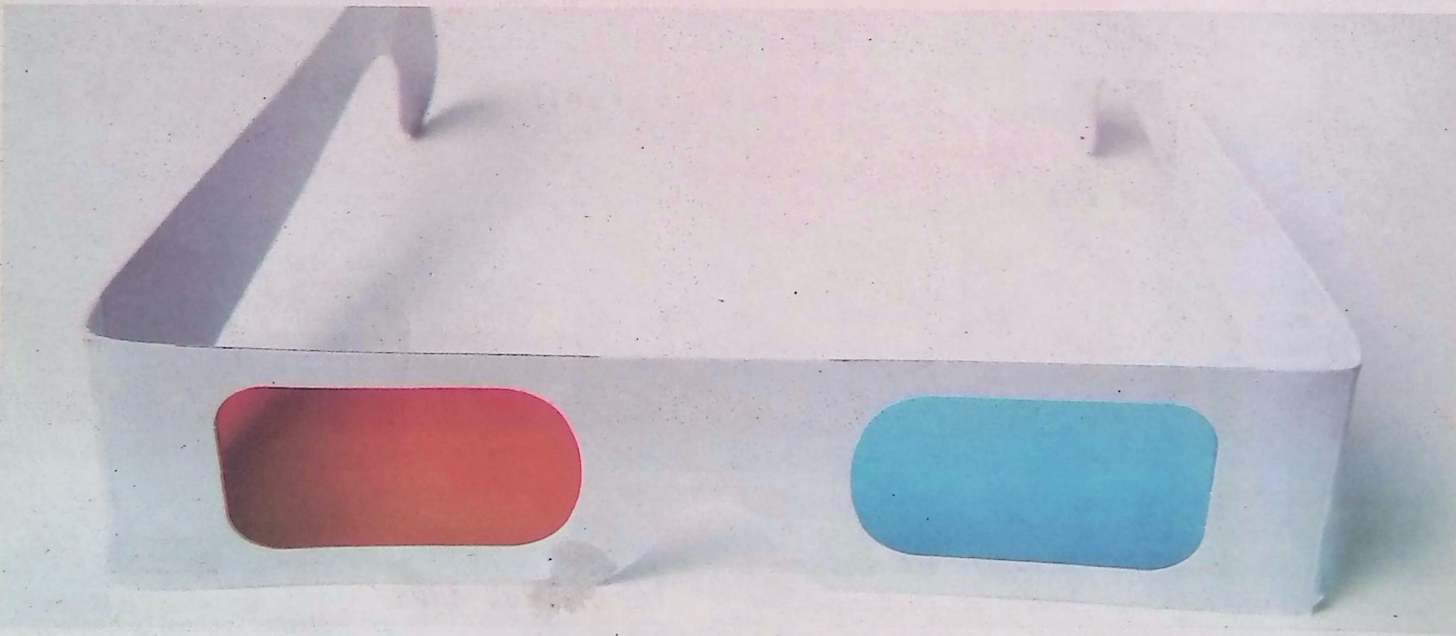
What's also opening up tremendous opportunities in terms of delivering 3D DV is the ability to use on an LCD screen at home, in the office or in a retail setting.

Some of these new viewing devices do require glasses (either shutter controlled or polarizing), but not all! It is possible to deliver a realistic 3D image using a specially designed glass cover, placed in front of the screen itself, that bends and shapes light in a manner appropriate for a 3D effect. Available in various sizes, from around 22" to over 50", LCD screens with 3D capabilities show tremendous potential not just in entertainment programming, including TV and video gaming, but also commercial applications (think about the potential for product placement in the third dimension), medical and scientific settings and many more.

If fact, 3D will be used in all media sooner rather than later. Citing just one example, 3D technologists noted that one major Hollywood studio, Dreamworks, has already said it will cease making standard 2D movies at the end of 2009.

Moving as it is from SD (standard def) HD (high def) and now 3D, digital video has got the right perspective.

*By Lee Rickwood*







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# Virtually a Billion Dollar Industry

*Advergaming: Product placement comes home*

I've been writing about PC games for a very long time. My first review was published in 1990 in what is generally regarded as the first magazine particular to PC games, Computer Gaming World.

Back then, CGW was a hobbyist magazine penned and assembled purely by hobbyists purely for hobbyist players and readers. The onerous presence of the corporate world seemed so very far away, and CGW's advertisements generally publicized mail order cottage industry games wherein the developer — often a group of college tech-heads — might make a few hundred bucks when all was said and done. But that's a reflection on what gaming was in 1990. It was a nerdy but essentially pure hobby — not unlike model railroading.

But today, that purity, that innocence, is, for the most part, gone. Today, the virtual streets are littered with the empty shells of small, independent developers either bought out or squashed by the corporate wheel. Intricate, hardcore games are few and far between, while graphically intensive titles built to appeal to the masses and spurred on by the younger, more impatient console gaming crowd, have in many cases taken over.

Yet nowhere is the corporatization of gaming more obvious than in the product marketing that surrounds and permeates it. The truth is that our games are not only becoming at least somewhat homogeneous, but also awash in advertising. One thing is certain — if you've ever finished playing a game and had a sudden hankering for a Subway sub or a big-ticket Bang & Olufson audio system or perhaps just a Pepsi, you're part of the "advergaming" generation.

## A commercial by any other name?

Just as it sounds, advergaming (an expression first coined in a 2001 issue of Wired magazine) is the umbrella term given to the marketing of product through video games. And right now, advergaming is big business. According to a report by Boston-based technology research and consulting firm Yankee Group, advertisers spent \$78 million globally in 2006 and more than \$180 million in 2007. Considerably more daunting are the annual projections of nearly a billion dollars post-2010. By anyone's standards, that's a whole lotta money.

## Above board

Like a shape shifter, advergaming takes on a variety of forms. Arguably the most powerful is known as an "ATL" (Above The Line) game. Essentially straight-up promotions wrapped in and around video games, ATLs are usually customized versions of previously released top-tier games, or purpose-designed mini-games available on Web sites or (before the days of the Internet) included in product packaging.

Examples of ATL games include "Chex Quest," a DOOM conversion found in boxes of Chex cereal in the late '90s wherein the environments were more cutesy than scary and the bad guys were purportedly teleported back to their own dimension rather than gorily blown apart.

A substantially more current case in point is Burger King's recent "Battle of the Burgers," an online boxing match at the BK site between the Whopper, naturally, and his apparent foe, the "Sleazeburger." If you attained any score that proved you weren't legally

dead, you'd win a half-priced Whopper and the right to challenge your friends. Of course, playing the game exposed you to oodles of Burger King and fast food imagery that may well have prompted you to grab a Whopper or three after you were done.

## Billboard

The second category, "BTL" (Below The Line), is quite wide ranging. But suffice to say that BTL adverage messages are more subtle than those of ATL games, often incorporated within "regular" titles. One need only look at recent top-tier sports and racing games to see the billboards for real-life products and the corporate logos built into the peripheral scenery or on the actual competitors, cars, and players.

## Below board?

Not nearly as popular as the first two categories, TTL (Through The Line) advergaming are often based on existing product, featuring URLs and links to entice the player to buy other goods related to that original product. An oft-used example of TTL marketing is the game "Enter The Matrix." Based on the film The Matrix — and not a particularly good game — Enter The Matrix sported in-game puzzles and the like that spirited players to Web sites where they would find available merchandise. Of the three forms of advergaming, TTL would seem to be the most insidious.

## But do I really need a Lamborghini?

Despite the loving look at an earlier, less commercialized age of gaming that opened this article, don't think for a moment that advergaming is new. Indeed, American Home Foods released a customized floppy disk game way back in the 1980s promoting its Chef Boyardee brand. And likenesses of real world automobiles have been used in driving games since the late 80s or so, subtly prompting the player to consider that particular model when he or she next goes car shopping. And there are plenty more examples where these come from.

But currently, advergaming is in the midst of a perfect storm of conditions that has allowed it to rapidly escalate. For starters, modern games look good. Even as recently as the turn of the millennium, the vast majority of games looked blocky and cartoon-like. But with the recent advent of high-powered PC video cards and muscular consoles such as the Xbox 360 and PlayStation 3, gorgeous, photo-realistic images are the norm in today's top-rung titles. And as any marketing exec will tell you, putting up a billboard or in-game signage in the midst of visual sophistication and beauty is far preferable to the highly pixelated environments of yore.

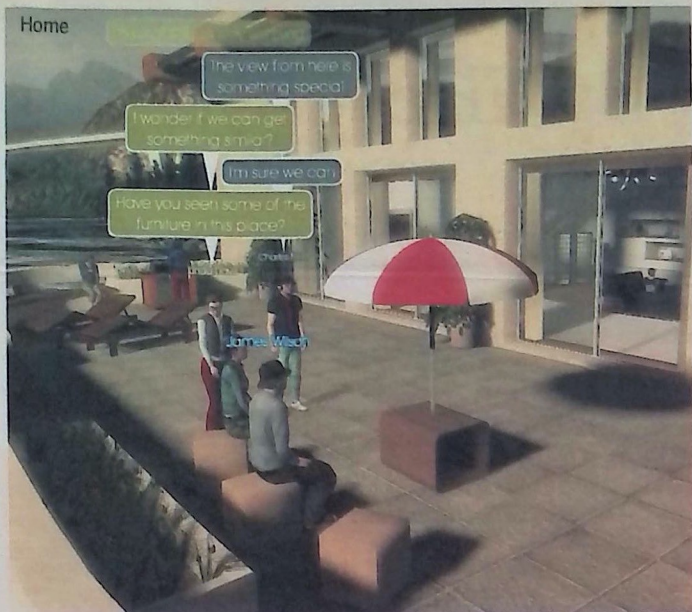
Perhaps more importantly, gaming is no longer a niche or a kid's market. In a 2004 study performed by Comscore MediaMetrix, 25 per cent of PC gamers are 35 to 44 years of age, 25 per cent of gamers playing free online games are 25 to 34 years old, and 33 per cent of those who play premium games are 25 to 34 years old.

But the real surprise may be the per centage of us

Second Life







who play. New York-based sales tracking firm NDP Group claims in a 2007 study that a whopping 72 per cent of the U.S. population aged six to 44 say they play games — an all-time high. Canadian data is not readily available but we can expect the larger North American trend would reflect the specifically US data. Moreover, of the consumers who do play, nearly half of them say they partake in online gaming with 90 per cent choosing the PC to do so.

Oh, for the days of Ed Sullivan...

But that's not all. As interest in gaming climbs, many other forms of media have become considerably less appealing to advertisers. Take television, for instance. It wasn't so long ago that mom and pop and all the kiddies in all the neighbourhoods in all the cities gathered around at the same time to watch the same prime time shows with the same prime time commercials. But with an ever-increasing number of stations, the Internet, and, yes, games, there are simply too many alternative home entertainment pastimes.

What about print media? One needs look no further than that very same Computer Gaming World magazine mentioned earlier in this story. CGW eventually morphed into Games For Windows magazine in late 2006, where it survived a little more than a year before, almost expectedly, dying a sad death just as it went to press. The truth is that people simply aren't reading print media as much as they once did.

There's something else about computer and video games that make them darned attractive to potential advertisers. Games are interactive. When a billboard races by, or when a virtual storefront appears, or when there's some other mention or visualization of a logo or a brand or a piece of merchandise, there's a very good chance the already-fixated player will take notice of it. The same cannot be said for television, where commercial breaks often translate to bathroom, popcorn, or refreshment breaks.

Get back to work!

And, unlike TV, games are often played at work (on a company sanctioned lunch break, no doubt) and during other hours when consumers traditionally couldn't be reached. Moreover, many games (and particularly the key passages of many games) are played repeatedly, thus offering the player multiple views of the advertising that occurs within that passage.

Is advergaming a bad thing? If it's regulated, not necessarily. Game builders and publishers certainly profit from it, which, in an ideal world, would translate to bigger budgets and better future games. And who knows — maybe you'll profit from it too by learning of some wonderful new product you hadn't encountered elsewhere.

There is one certainty — advergaming, going forward, is inevitable. Even now, virtual worlds such as "Second Life" and "Home" (exclusive to the PlayStation 3) feature real world content and advertisers. Companies such as Advergame.com, which calls itself "the leading provider of client-branded interactive entertainment content for Fortune 1000 companies and the world's leading brands," have sprung up solely to service the industry.

And finally, is there any doubt that anyone, even grizzled computer game reviewers, would prefer virtual billboards or Web site mini-games to Internet pop-up ads and other, more conventional forms of invasive marketing?

By Gord Goble

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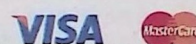
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# DSLR Trial By Fire

## *Nikon D300 field report*



I can't recall how many times I've thought "that's exactly how I hoped it would turn out" when reviewing photos taken with the Nikon D300. Not always, mind you, because there are a lot of settings to learn, but enough of the time to confirm this camera's reputation as one of the finest pieces of camera technology available today. No doubt, the D300 is a complex and capable instrument but its interface is not overly-complicated — but I should put that argument in context.

The D300 is aimed at the enthusiast market, and the price of admission is that you know something about camera controls. If you don't you'll have to claw your way up that learning curve before the beauty of the D300 starts to reveal itself.

On the other hand, if you know your way around, then once you finish a basic orientation on how the D300 gets you there, you can start shooting and creating some very satisfying images. The D300 makes it very easy to get to this first level. The buttons and switches are, to my mind, well labelled and well placed, and you'll recognize the purpose of most of the basic camera soft menu controls because they are clearly marked.

You can leave it at that and have a very productive photographic life, but a D80 will take you that far too, for less money and less weight. The D300 offers a lot more, and the depth of control you can exert over the D300 begins to show once you get into the more advanced settings or the Custom Setting menu (the 400-page user manual also gives you a hint). Here, you'll need to play student for a while because there is a lot of data to process.

### **Have it your way**

A custom settings bank allows you to save up to four sets of settings and give each a unique name (using an on-screen alphanumeric keypad). What can you customize? There are 10 autofocus parameters, another 10 for adjusting or customizing controls, more than 10 dealing with display and shooting variables, six dealing with exposure and metering, a handful controlling various timers, and a half dozen for external flash operation.

One unusual feature the D300 shares with other higher-end Nikon gear is built-in support for GPS. You can buy GPS units that plug directly into the camera's MC-35 serial port, and each time you take a picture the D300 will read the GPS co-ordinates from the device and include it as part of the image file's EXIF metadata. I tried one such product and it worked flawlessly.

Other features that are a little unusual and may be interesting to some are an intervalometer (for time lapse sequences) and the ability to shoot multiple exposures. Some previous Nikons implemented a post-exposure shadow brightener called D-Lighting. The D300 takes it a step further with Active D-Lighting, which you can implement as a camera setting.

The Nikon D300 was one of two cameras I took on a two week trip to Japan (the other was the Olympus E-3, which I wrote about last month). They have a lot in common although they differ in the details — like two sports cars from competing manufacturers. Both are built like tanks with the weight to prove it, but are

exceptionally well balanced. And both are a real pleasure to use, although the D300 seems better matched to the way my logic works.

### **In the field**

Prior to the trip I used the D300 during a photo workshop where the temperatures stayed at -20 for the entire outdoor shoot one morning. During that frostbitten session my fingers refused to work long before the camera slowed down.

Then it was off to Japan, where the daytime temperature ranged from high single digits to low teens. I encountered rain on two days, and in moving constantly from the damp cool outside to humid warm interiors, much to my dismay the focusing screen of the D300 fogged over both times, to the point that the red illuminated squares that indicate focus lock disappeared and all I could see of them was an eerie red glow. The actual focusing mechanism wasn't affected apparently as the images I took seem to be in sharp focus. And the camera seems none the worse for the experience. And, by the way, that 51-point autofocus gives tremendous flexibility to place the focus point anywhere in the frame.

I visited a lot of historic sites where using a tripod was inconvenient and often not permitted, so I was yearning for some kind of image stabilization. The new Nikkor DX 16-85 VR lens seems like a great match for this camera, although I haven't had the opportunity to use it. But to help out in low light situations, the D300's high-ISO performance is exceptional. Noise from ISO 800 isn't much different than at ISO 200, which is the camera's base sensitivity. Conservatively, you get two stops for free and you take them as faster shutter speed. I used higher ISO a lot in darker places like the interiors of temples, and without worrying about the noise degradation effects you normally associate with high ISO.

### **Is it live?**

The D300 has two modes of Live View but I didn't use either extensively. One of the reasons I like SLRs is because of the optical viewfinder, and in the case of the D300, it doesn't get much better — near 100 per cent frame coverage and 0.94 magnification. One reason why Live View might be a better experience on the D300 is because of its outstanding three-inch high-resolution display. The first time I saw a high-res display on the Epson P-2000, I thought I was looking at a transparency on a miniature light table. The D300's display makes me think the same thing.

You can tune the D300's white balance in five-mired increments along both the blue-amber and green-magenta dimensions. This offers fine control over colour, but it actually threw me for a loop — before I realized I'd accidentally tuned the auto white balance with a B3 setting (15 mireds more blue), I was scratching my head wondering why all my daylight shots were coming out so cold. Duh!

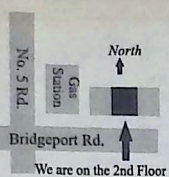
### **Final thoughts**

this is a camera that a photographer with intermediate knowledge can pick up and immediately enjoy. It's also one that will continue to serve as your technique and knowledge grow. Frankly, it's more camera than I need at my level, but not more than I want.

*By David Tanaka*







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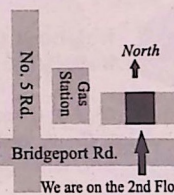
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# More Than A Day In The Life Of A Game Developer...

## 31 hours Ubisoft's Philippe Therien

Those of us who love games, much like people who love movies, inevitably find ourselves daydreaming about what it must be like to make a career out of creating the entertainment we so enjoy. We fantasize about the creative work environment and having the ability to spend our days toiling on a labour of love.

With that idyllic vision in mind, HUB: The Computer Paper recently spoke with Philippe Therien, Game Designer on Ubisoft's Tom Clancy's Rainbow Six Vegas 2, which released in late March. We asked the 30-year-old interactive entertainment engineer to describe a day in the life of a game developer.

At first, his account of a workday that took place midway through the game's development cycle — which we have paraphrased in journal-form below — sounded like the dream job we had imagined. He and his coworkers spent the morning experimenting with the original Rainbow Six Vegas on a private server and playing with action figures.

But as he described how the day wore on — and on, and on, eventually turning into a 31-hour marathon — we came to

realize that the job of a game designer is more than just fun and games.

**09.00hrs – Play Rainbow Six Vegas**  
Philippe arrives at work with one thing on his mind: Locking down the final feature set for Tom Clancy's Rainbow Six Vegas 2. His first priority is to come up with a valid prototype for the artificial intelligence that governs the actions of non-player characters. He and a group of fellow designers boot up the original Rainbow Six Vegas on a private server and divide themselves into "human" and "computer" characters, the latter of which attempt to move and respond to events in ways that they would eventually like the sequel's computer-controlled soldiers to mimic. Eventually they come up with an idea they like: A leapfrogging system in which an individual soldier moves forward while his partner covers him from a shielded area. Video cameras are called in to record the action.

**12.00hrs – Lunch and a movie**  
Philippe and his colleagues discuss the morning's session over lunch. They

review the video footage as they eat, discussing what worked and what didn't. They start to make notes, and by the end of the hour they have managed to cobble together a PowerPoint presentation meant to explain to the game's programmers what they want AI characters to do.

### 13.00hrs – Meet with programmers, play with action figures

The programmers watch the PowerPoint. Philippe and his teammates bring out action figures and use them to further illustrate how they want the game's computer-controlled characters to act. Philippe's team has been known to bring out prop guns and run around the halls of Ubisoft's office like a plainclothes SWAT team to better demonstrate what they would like action to look like in their games, but this isn't necessary today; the coders get what they want right away.

### 14.00hrs – The crisis

Philippe heads out on his regular afternoon stroll around the floor, talking to individual developers to make sure everything is proceeding as planned. Trouble is awaiting him. He soon learns that one of the game's primary new features [he wasn't able to tell us what this feature was] is a no-go. Turns out technical limitations make it impossible to implement the feature on all of the platforms for which they intend to release the game. Time to call Ubisoft global headquarters in Paris. After hours of discussion, they realize that there's no way to get around the problem. Their killer feature must be axed. This is bad news.

### 19.00hrs – Emergency brainstorming session

The team orders in Chinese food and sits down for an emergency brainstorming meeting. Thinking up new game concepts is the last thing they want to be doing on the day that they were supposed to be finalizing the game's feature set, but they need to come up with something to replace their now unusable killer feature. Several ideas come up, none stick; there's just not enough time to properly develop any new concepts at this point in the cycle. After six hours of fervent discussion, they realize that it's no use. It's too late to add anything; the game has all of the features it will ever have — and one less than they wanted.

### 01.00hrs – The long walk back

Dejected, Philippe and the rest of his team walk out of the conference room and heads back to their offices. On the way, one of Philippe's colleagues muses, "What if we just focused on

what we've already got?" Everyone stops walking, waiting to hear more. "We've got a great game already. Let's reward players for playing it. For the different ways they approach it. It could be a great way to let people appreciate the tactics." The team latches on to the idea right away. It's sufficiently simple to blueprint at this late stage and also interesting enough to potentially become the game's signature feature.

### 02.00hrs – ACES is born

Philippe and his colleagues are exhausted, but they're also excited. Coffee is procured. The game's lead story writer is called, raised from a dead sleep, and asked to come back to the office. They sit down as a group to flesh out the details of their new idea. Players will earn experience points in three disciplines: Marksman, Close Quarters, and Assault. Different kinds of kills will count towards each discipline; a head shot will earn Marksman points while a point blank kill will result in Close Quarters points. As players level up they will earn new kinds of weapons, clothing, and armour. In a matter of hours, Advanced Combat Enhancement Specialization (ACES) — what would eventually become the game's most raved about feature — is born. They put the finishing touches on the plan as sunlight starts to creep through their office windows.

### 08.00hrs – Presenting ACES to the suits

Philippe and his team meet with their bosses to present their complete list of game features, which includes ACES. It's approved immediately. The final feature set is documented on Ubisoft's servers and begins circulating among the game's programmers less than two hours later — right on schedule.

### 09.00hrs – The grind continues

Philippe and the rest of his team, already inhabiting the office for a full 24 hours, settle back into their chairs, ready to begin another day's work. Philippe will be in the office for another seven hours. The idea of taking the day off doesn't even enter his mind; there is still plenty of work left to be done. After all, critically acclaimed blockbuster games don't design themselves.

By Chad Sapieha

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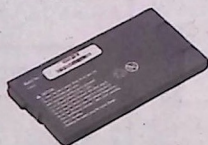
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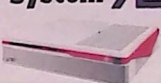
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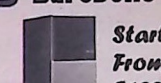
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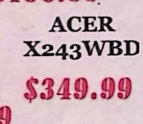
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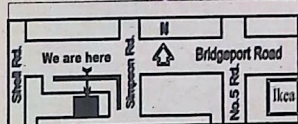
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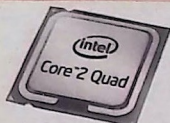


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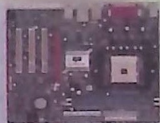
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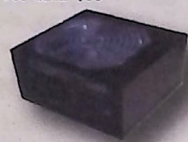
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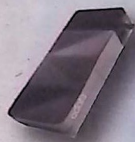
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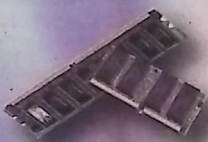
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# You've Been X'ed

## Working with Microsoft's new document formats

With its new Microsoft Office 2007, Microsoft changed the document format that it uses to save Word, Excel and PowerPoint files. This change in document format has heralded cries of anger and frustration from unfortunate users who are unable, for one reason or another, to access these files.

Part of the problem is not new. In the nineties, it wasn't unusual for one program to be unable to read the files created by another. However in the last decade we've been lulled into a state of expecting that program file formats are universally translatable so that even if we're not using Word, for example, we'll still be able to read Word files — somehow. In fact, Microsoft has not made any really significant change to its file formats since Microsoft Office 97 and the file formats for each successive version of Office have been pretty much backwardly compatible with earlier Office versions. So you can, for example, work with Microsoft Word 97 and still be able to read documents

created in Word 2003 although with some reduced functionality in the case of advanced features. In addition, Microsoft file format compatibility is a feature of most other office suites so you can open Microsoft Word and Excel files, for example, in OpenOffice.org and save in those formats too.

With the new Microsoft Office 2007 Microsoft has thrown compatibility out the window and its new file formats are not only incompatible with older versions of Office but they aren't supported by other office suites either. Hence the problems users are experiencing. If you receive a Word 2007 .docx file, for example, you can't open it in anything other than Microsoft Office 2007 without doing some work.

### Know your opponent

The new Microsoft Office file formats are easily identified as they are four characters long and they're the same characters as the older extensions with an added x, so they are docx, xlsx and

pptx. These new files are very different inside and they are XML based. In fact, they are really just a zipped and renamed set of smaller files. If you're so inclined, and if you have a new format file handy, rename it with the zip extension and open it to see what it is comprised of. Of course, this won't help you do anything much with it but it's interesting to see.

### Work-arounds

There are a number of options for using Office 2007 files with earlier versions of Office or other programs. One simple one is to ask the people working in Office 2007 to save using the appropriate 2003 version format. This will require that they work in what is called Compatibility Mode and they will have a reduced function set available but it will ensure that the document is still accessible to everyone else.

If this is not an option and if you are using Microsoft Office 2003 or earlier and don't plan to upgrade, you can download and install the Microsoft Office Compatibility Pack for Word, Excel, and PowerPoint 2007 File Formats from <http://tinyurl.com/3xr4tt>. Once installed you can open files using the new formats in the older application, so you can open Excel 2007 files in Excel 2003, for example. The converter is compatible with Microsoft Word 2000 and 2002, Excel 2000 and 2002 and PowerPoint 2000 and 2002 provided that in each instance the appropriate Service Pack 3 is installed.

However, because this converter works from inside the appropriate Microsoft Office program, it will only work if you're using Microsoft products and is of no use if you're an OpenOffice.org user, for example.

### Out of the-Office

Luckily there are some other options available. One of these is [docx2doc.com](http://docx2doc.com). This is a Web site which converts Microsoft Word .docx format files into .doc files that can be opened in any program that can handle .doc files. The site only handles .docx files and can't convert Excel 2007 or PowerPoint 2007 files and it operates on a 24 hour delay if you opt to use the free conversion. To convert your file, you browse to locate the .docx file and type your email address. When you click Convert DOCX the file is uploaded and it will be converted and emailed to you after 24 hours. You can get instant conversions if you pay \$5.00 US for

one year of the service.

There is also an offline converter available called DOCX Converter from [www.panergy-software.com/products/docxconverter/index.html](http://www.panergy-software.com/products/docxconverter/index.html) which can convert the Word .docx format to .doc and also .xlsx files to .xls format. It is available for Windows and Mac operating systems for US\$19.95.

Another free service with a much shorter turnaround and more flexibility still is Zamzar.com. Here you can convert from .docx to .doc, .odt and .txt among other types, and from .xlsx to .ods for use with Openoffice.org and .csv or .xls. The same Web site has a .pptx converter which will convert the new PowerPoint 2007 format to PowerPoint 2003's .ppt format as well as the .odp format. It is simple to use and very fast.

If you are using OpenOffice.org there is another solution offered at <http://katana.oooninja.com/w/odf-converter-integrator>. This site offers links to a range of ODF converters which convert Microsoft Office 2007 files into the appropriate OpenOffice.org formats. These converters run on various operating system including Fedora/Red Hat/Centos, Ubuntu, Novell/SUSE and Microsoft Windows and there are instructions for each operating system and links to the relevant downloads here. If you're using Windows, you'll simply double click to run the installer and then install it in your program files folder — I changed the default install folder so it would be located with my OpenOffice.org installation for neatness.

To convert the document, simply run the ODF-converter-integrator from your All Programs menu and when the Open dialog appears select the file to convert. The program will automatically convert the file and save a converted version in the same folder as the original. If your file associations are correctly assigned, it will also open the resulting file in the appropriate OpenOffice.org program.

While most of these solutions aren't totally seamless, they do offer a solution to the very frustrating question: "And, just what am I supposed to do with that file?"

By Helen Bradley



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# Appeasing the Search Engine Gods

*pt. 2 - Social network linking: Innovation or Internet folly?*

Last month, we looked at the rise of the search engines and tricks people have used over the years to get their pages ranked higher. Techniques that are almost as old as the search engines themselves. However, in the days of what's commonly called Web 2.0, a growing trend in achieving higher rankings is through the use of social networking sites. Portals such as YouTube, Facebook and LinkedIn receive millions of combined visitors per day. Many of them are filled with rich content such as video, links, contact information, and personal and corporate profiles, all appealing to Web crawlers.

Tricia Ryan of The Marketing Chefs, a marketing strategy company located in Mississauga, strongly believes that her contributions to social networking sites has been a big factor to her online success.

"Each day I spend some time posting material to a different networking site," she says. "My ranking has improved substantially from this."

Ryan combines social network postings with search engine registrations, blogs, key words and links. She also does a great deal of offline advertising, directing people to her site where she sells training materials and courses.

This is a very different business model from Performance Diesel Injection, introduced in part one last month. A new business located in Markham, Performance Diesel services a very specific segment of the automotive industry. For its owner Giles Gallie, drawing traffic has been done through industry forums rather than general interest social sites.

"I regularly contribute to all the automotive performance forums. People find me through those," says Gallie. "I also refer new clients to the site when they call. It's a nice selling tool that answers a lot of their questions while freeing up my time here at the

shop." The actual sale happens off-line though; Performance Diesel doesn't sell online.

While from two different industries, both Marketing Chefs and Performance Diesel use a form of Web networking to draw traffic with fair success.

So is social networking on the web really the "honest" approach or just another trick soon to be made obsolete by updated search engine algorithms?

Michael Koenigs the CEO of trafficgeyser.com says posting to social network sites for the purpose of driving visitors to your site is like playing a game the search engines wrote the rules for.

"We're ahead of the game," says Koenigs. "The search engines know that half the traffic is video based, so they are keen to focus their efforts on it. We simply make it easier for site owners to take advantage of this new and exciting format."

Trafficgeyser.com is an online service that will submit your video, podcasts and blogs to over 35 social networking, blog, bookmarking services and video sharing sites with the click of a mouse. According to Koenigs, the concept is simple and effective: Posting blogs and videos, with key words, links and descriptions attached, to as many social networking sites as possible will result in higher search rankings.

The theory is that as the Web crawlers scan the Web for video content and blog submissions, they will continuously come upon your name and site. This will result in higher rankings as your information will be "calculated" as being more relevant. In one online demonstration for the service, a new site was listed as number one on a Google search within 10 minutes of going live.

So do the search engines view this process as just another form of link farming? Or is this a truly legitimate and effective way to bring traffic to your site

and get higher search rankings?

When I put these questions to trafficgeyser.com's Koenigs, his answer was quick and to the point. "We follow the rules set out by the video and blog sites," he says. "Their own users decide if the content is poor. And that content is created by the site developer (our clients), not us. The search engines are just being fed content by us. They're looking for it. We just get caught up in the stream of providing them relevant and useful information."

Ryan from The Marketing Chef agrees. "While I have used some submission services, I still do a large number of blog and podcast submissions manually. I have found them to help draw traffic either by improving my search result rankings or through direct links to my site."

However not everyone agrees with the effectiveness of this new traffic producing technique. When I contacted Google directly about this new trend, they were scratching their heads.

"A Web site receiving first place ranking within 10 minutes of being uploaded?" a spokesperson for Google asked. "I don't see how that could be possible."

Google's formal position on increasing Web traffic is based on relevant content first and foremost, both on the site itself and any blogs, video postings and podcasts.

"Many owners of high quality sites can and do get their site listed well in Google's search results without any outside help. Most often, some basic, relatively simple tweaks go much farther than any secret 'tricks.' For instance, using a journalistic mindset to write page titles — concisely answering who, what, where — can be of great help to both users and search engines," says Google's spokesperson.

"Understandably, some site owners prefer to have someone else check and optimize their site, and for these folks we've published some guidelines relating to evaluating SEO companies," explains Google's spokesperson.

"In order to deliver the best search results to users, Google frequently crawls the Web in search of new content. Every time Google crawls the Web, 10-20 per cent of the Internet is new. By submitting your Web site to Google, you help with the process of finding your site and adding it to the search index. However, we strongly encourage Webmasters to pay very close attention to the 'Quality Guidelines,' which outline some of the illicit practices that may lead to a site being removed entirely from the Google index or otherwise penalized."

Among Google's guidelines: "Avoid tricks intended to improve search engine rankings" and "don't participate in link schemes designed to increase your site's ranking or PageRank."

Since guidelines similar to Google's can be found on other search engine's sites, does this mean that posting to social networking sites is actually pointless or even harmful?

"I don't think it's pointless," says Joseph Fung, CEO of Lewis Media, a Web design





firm in Waterloo whose clients include RIM and Scotiabank. "It's not a bad way to spend your time. Just maybe not the best way."

The fact is that while social networking and blog sites might attract the short term attention of the search engines, their content tends to be time sensitive. As new submissions are posted, previous ones will drop lower on the list, getting less page views, and eventually falling off the search engine's radar. All this can happen in a matter of days.

"Long term success means building a relationship with the search engines," says Fung. Posting to established industry-based sites will add legitimate credibility to you because the search engines hold those types of sites in higher regard for your field than generic social sites. Posting to sites that are recognized as relevant to your industry will give you the best return for your time. And keep you on the good side of the search engines."

So what is a site owner to do in order to drive traffic to their site? And should they even be that preoccupied with it?

For some, who's entire business model involves selling over online, such as Amazon and eBay, the answer is yes. And yet these companies have chosen to not get swept up in the trend of social marketing. Instead they have combined traditional and proven methods such as external links, banner ads and relevant content with strong offline advertising campaigns.

"In 2007 our online and offline advertising was split 50/50," says Fung. "For 2008 we plan on allocating 80 per cent to offline marketing. We've found that offline media reaches our audience in a way that allows us to convey certain messages more effectively."

Where is all this going you ask? What is the future of search engine optimization? The truth is that not even the search engines know.

"Search is still in its early days of development and it remains at the core of everything Google does," says Google's spokesperson. "We are aware of new trends and technology and are focused on leveraging it to provide relevant and useful results."

"Search engines will become smarter," says Fung. "I believe we'll see higher levels of analysis, voice processing of video content, and drawing meaning out of content. I think the search engines are chasing two targets, the human element (understanding relevance) and the people coming up with the next set of tricks."

Most experts would argue that a Web is just one more spoke in the rotating wheel. And regardless of

how many visitors you get, if your products and services are of poor quality, your business will not succeed.

"If you produce high quality products at fair prices, people will buy from you," says Fred Gleec, an Internet marketing consultant based in Las Vegas, NV, USA. "In many situations, offline marketing is more powerful than online marketing because people are bombarded with so many banner ads and spam messages, they don't even

notice them anymore. If you market yourself properly and give people quality, they will seek you out."

It's interesting to note that eBay, the world's largest online auction site, came up as number eight in a recent test search for "online auctions" on Google. Amazon was listed as number two when "online bookstore" was entered, just behind Chapters/Indigo, which paid for their listing.

By Marc Gordon

Marc Gordon is a professional speaker and the owner of Fourword Marketing, a branding and marketing firm located in Thornhill, Ontario. Fourword specializes in helping businesses create a brand identity and developing effective marketing campaigns. Marc can be reached at (416) 238-7811 or visit [www.fourword.biz](http://www.fourword.biz).



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# Ultra Inexpensive Ultraportable

*ASUS Eee PC successfully treads a fine line*



We here at HUB: The Computer Paper are computer and gadget fiends. It's part of the job description. We maintain a critical eye and try not to buy in to the hype. That's also in the job description.

So with that said, it's not often that a device captures our attention as thoroughly as the ASUS Eee PC has. For months leading up to the release of the diminutive Linux-based lappy, we watched. All the pieces seemed to make sense; it's a true ultraportable with everything most users could want at a price that is completely unheard of in the ultraportable space. We finally managed to get our hands on one for an extended test drive.

The heart of the Eee PC is a customized one-click version of Xandros Linux that uses IceWM as its GUI and window manager. It uses a tabbed desktop with one-click access to an array of oft-used functions such as opening a Web browser, creating a word processing document or spreadsheet, accessing system settings, the file manager and so on. Many of these one-click shortcuts are in fact Internet shortcuts, such as with Google Docs, email and such. This is a cool concept as more and more of us migrate to the so-called "cloud": online workspaces that are largely platform agnostic and always available, no matter where in the world you are.

For basic computing functions, the Eee PC is a winner; its diminutive size and weight, reasonable battery life and sub-30 second start up time make it an excellent interim step between a dedicated PDA and a full laptop PC. It's infinitely more portable than a standard laptop (not to mention much less expensive) and offers considerably more functionality than a PDA.

The fact that it ships with a form fitting neoprene protective sleeve falls under the category of nice touches. Since the review period began, the Eee PC has always accompanied me about town, stowed in my backpack. Unlike a full-sized laptop, you don't even have to go through the debate balancing how much weight it adds to your bag vs. how much you're likely to use it; it only weighs just over 900g after all. The manufacturer stated 2.8-3.5hr life for the 4-cell battery is attainable but for a more usable Eee PC though, using wireless and a reasonable screen brightness, expect more in the order of 2.5hr. Not bad but not great. Also, the Eee PC's sleep mode, activated by closing the lid, doesn't conserve battery life as well as it should. Leaving the Eee PC in what should be a deep sleep for several hours, don't be surprised if you return to find the battery completely depleted. Fortunately, a full system start-up from off to desktop only takes about 28sec.

Its diminutive size and low price (to say nothing of what is a completely new operating environment for many users) means that some sacrifices are made and some adjustment is required on the part of users. Its small keyboard is among the most usable we've seen on a laptop of its size. This review was written entirely on the Eee PC without issue... once we got used to the fact that the left cursor key feels like it's where the shift key should be and the number row is set one key to the left.

Its screen is a tiny seven-inches with a maximum resolution of 800x480. This represents the biggest adjustment that has to be made. Using Firefox, for example, you'll want to familiarize yourself with the keyboard shortcut for switching to full-screen (F11). Consider also that as a Linux-based PC, even power users of Windows or Mac PCs will have to learn how to work with the portable PC. For a vast majority of common tasks, it's not that different; just different names for what is, in essence, the same thing. However, if you're looking to get your Eee PC linked in an existing network, be prepared to do a little reading first. To this day I haven't been able to get the Eee PC to talk to my wireless networked home printer though.

## Starting up

As mentioned previously, the Eee PC is ready to go a mere 28 seconds after hitting the power button,

located on the top right of the keyboard portion of the computer. Assuming you're using a pre-configured wireless hotspot, you can have your WiFi running and a Web browser in about 40 sec. That's an impressive feat. In our testing, the Eee PC has become the go-to computer for a quick information grab at home; my Windows XP desktop takes considerably over a minute to start up and an underpowered Vista laptop takes nearly two.

## reStarting up

Given that the Eee PC has a maximum factory storage capacity of 8GB (we're testing the 4GB 'Surf' model) it may seem strange at first that the Eee PC reserves some space for a factory restore partition. However, consider that the Eee PC is among the first device entries in the "cloud computing" concept and it starts to make more sense. If, by chance, something goes wrong with your Eee PC while travelling, a full restore to factory default settings less than five minutes. Your OS could die a horrible screaming death (though in fairness, it's been nothing but stable in our extended test period) and you could shut down and restore to factory default before your coffee has even cooled down enough to drink. You're back in the data cloud with complete access to your data.

## The user interface

The customized IceWM user interface is divided in to logical tabs: work, play, Internet and so on. Each of these tabs is loaded with links to online services or pre-installed applications like the MS Word equivalent OpenOffice.org, Skype, Pidgin multi-protocol instant messaging client and so on. This is a unique way to interact with a PC and while those not opposed to a little fiddling around in Terminal can easily add in full Xandros desktop functionality, it works very well for just about everything you'd need to do in a given work day or weekend. Logically it makes sense to break things down using the ASUS Eee PC's own tab titles.

## Internet

As the title suggests, this tab looks after everything to do with online. That includes the obligatory Web browser (Firefox) and email (though the Email icon here actually just offers a series of shortcuts to online email services like Gmail, Yahoo! Mail and Hotmail). You're

## HUB: The Computer Paper's Editor's Choice award

is given to top-performing or groundbreaking products that the editors of HUB: The Computer Paper have chosen as excellent entries. With the HUB: The Computer Paper Editor's Choice Award seal, readers can be assured that a product is an example of how to do it right and is worthy of the accolade.

By allowing for a truly grab-and-go mobile computing experience, we're pleased to award the ASUS Eee PC the HUB: The Computer Paper Editor's Choice Award. By paring down the core components and as such, the cost, the Eee PC is an affordable ultraportable computer. It takes the intimidation factor out of using the Linux operating system for many users while still offering a full suite of applications. Based on general public license (GPL) principals, the Eee PC is an excellent introduction to the world of open source software and a customizable computing experience unlike anything that's been offered to date in an ultraportable. The Eee PC is an excellent first of its kind; it creates a brand new category of mobile device and has already inspired other manufacturers to follow suit with competitive offerings.

ph  
sign





offered links to Skype and a multi protocol IM client (Pidgin) as well as links to Internet radio and the iGoogle personalized homepage (www.google.com/ig). Also, wired and wireless networking settings can be accessed.

#### Work

Under the Work tab, users have access to a personal information manager (PIM), dictionary, OpenOffice.org spreadsheet, document and presentation (Calc, Write and Impress) applications. Also, you'll find the Thunderbird email client which is useful for offline email management; composing an email while away from an Internet connection, for example. The File Manager functions a lot like Windows Explorer, allowing users to navigate to files stored on the Eee PC.

#### Learn

In keeping with one of the Eee PC's goals of satisfying students, this tab contains several applications like a typing tutor, fraction and geometry tutorials, a periodic table of the elements and a neat but slow to start planetarium application called Kstars.

#### Play

In addition to a few casual games that won't hold anyone's interest for long, here you'll find photo, video and music manager apps, a media player that handles a majority of common format, a sound recorder and a camera application that allows you to fine tune the 0.3MP cam built in to the top bezel of some models. Strangely, this camera can not be used as a web cam. At least not out of the box.

#### Settings

This is where you go to tweak the Eee PC to your own preferences. Here you'll find a powerful self-diagnostic tool that can check on just about everything to do with the Eee PC. There's also an application to add or remove software though the options here are severely limited, drawing only from ASUS' own software repositories. Linux buffs can easily access Synaptic in Terminal or full desktop mode and a few tweaks allow you to add in other sources for GNU software too. However, accessing installed programs that aren't specifically designed for the Eee PC's tabbed interface is difficult if not impossible.

#### Favourites

A customizable pane that can be configured to display your most used sites and services.

#### Final thoughts

The Eee PC dials down the specs as compared with budget notebooks from the likes of HP, Dell et al.. Smaller hard drive, smaller screen, slower processor. However, it outperforms budget laptops in pure portability and ease of use. You're much more likely to toss the Eee PC in your bag for a trip across town and pull it out for a little on the go computing while in transit, while waiting for an appointment or sitting down for a coffee. It's also the perfect portable for young students and, hooked up to a keyboard and monitor at home, it makes an ideal second family PC.

By Andrew Moore-Crispin

#### By the Numbers

ASUS Eee PC 4G Surf (tested)  
\$349.99 www.asus.com  
Display: 7-inch, 800x480  
CPU: Intel mobile CPU and chipset  
Communication: 10/100 Mbps Ethernet; WiFi 802.11b/g  
Memory: 512MB, DDR2-400  
Storage: 4GB Flash  
Audio: Built-in stereo speaker; Built-in microphone  
Battery Life: 4 Cell, 2.8~3.5hrs  
Dimensions: 22.5 x 16.5 x 2.1~3.5cm  
Weight: 0.89kg

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# Building the Ultimate Game PC pt. 1

*A look at what's to come for the Ultimate Game PC*

Building the Ultimate Game PC means choosing the ultimate in components. However, there's more to the equation than the best processor(s) + the best video card + the most / best RAM + the fastest and highest capacity hard drive available + the very finest sundry other component parts= The Ultimate Game PC. Rather, the Ultimate Game PC is one that balances cost with performance without sacrificing either.

We won't claim to be creating the most powerful game PC ever. Nor will we build the least expensive. Rather, our build will attempt to walk the razor's edge to offer the best of both; the Ultimate Attainable Gaming PC, if you will. It will be a learning process – hopefully for us and you both. We welcome your feedback; visit [www.hubcanada.com](http://www.hubcanada.com) to comment or get in touch. And make sure you enter for a chance to win the Ultimate Game PC when we're done building it.

Computer parts aren't cheap. However, going the DIY route, you can save money over factory built gaming PCs and you're afforded options beyond what some manufacturers provide. You can choose from a wealth of different

component makers, choosing the best balance of price and performance on everything from RAM to the optical and hard drives, the CPU, the motherboard, power supply, case and more.

## Case

**Thermaltake Armor+ Full-Tower ATX Case**  
**VH6000BWS**

~\$280 [www.thermaltake.com](http://www.thermaltake.com)  
When purchasing a case, you're presented with several choices. The first and most fundamental choice is between desktop (horizontal) or tower (vertical). Obviously, we'll be opting for the tower configuration. Specifically, we'll get a full ATX case. We've chosen the Armor+ from Thermaltake. The reasons are many. First, it looks cool. Second, it is cool, which is to say it has excellent airflow and even an option for simple and effective liquid cooling. Third, it has plenty of space for the myriad cards we'll be cramming in to the thing. There's space for 10 PCI slots, which should leave us plenty of room for a couple of nVida cards in Dual SLI configuration. Quad SLI (four nVida cards connected together to form

one overriding GPU) or Quad CrossfireX (four ATI cards in a similar configuration) need at least eight PCI slots says Ramsom Koay of Thermaltake, a keystone computer component retailer. It also has a wealth of drive bays for optical and magnetic disks. Given that the hard drive is often a major bottleneck in high end systems, stringing two or more drives together into a RAID configuration can provide a significant performance boost (RAID 0 or striped). We'll be air cooling our rig. The Thermaltake Armor+ case can act as either an air or liquid cooled case (complete with an external coolant recharging port on top of the PC).

## Hard drive

**Western Digital VelociRaptor**  
**WD3000GLFS**

~US\$300 [www.westerndigital.com](http://www.westerndigital.com)  
By the time this issue of HUB: The Computer Paper hits the streets, Western Digital will have just released its newest hard drive. The VelociRaptor is an evolutionary step from WD's well known Raptor line. It is being billed the fastest SATA drive in the world.

It's a 300GB drive that is built for

enthusiasts with the reliability enterprise systems require, WD claims. The VelociRaptor is a two platter, four head design that spins at an incredible 10,000 RPM. The drive is mounted in WD's own IcePAK cooling enclosure. It uses a blistering SATA 3 GB/s interface with a sustained data rate of 120 MB/s.

The HDD is often a bottleneck in PC performance given that they're slow to access data. The VelociRaptor should go a long way toward remedying that.

## Optical drive

**Internal Super Multi Blue Blu-ray Disc Rewriter and HD DVD-ROM**  
**LG GGW-H20L**

~\$300 [www.lge.ca](http://www.lge.ca)

While there are currently no PC games shipping on Blu-ray disc, it makes sense to get an all-in-one optical drive solution. We'll be using LG's GGW-H20L, a Blu-ray ROM reader and writer / rewriter and LightScribe ready DVD recorder. Having a Blu-ray burner puts us at the vanguard of desktop PCs and while Blu-ray media is still on the expensive side at about \$25 per disc, we can still burn DVDs as well as disc labels using LightScribe, watch HD DVD movies (if we can find any) as well as Blu-ray releases.

Coupled with the 24" LG L246WH High Def display, we'll be in great shape.

Using the LG drive in our rig will future proof us for the time when games begin shipping on Blu-ray discs. With Blu-ray being the current confirmed standard for HD optical media (RIP HD-DVD), it's only really a matter of time.

## Motherboard

**ASUS Striker II Extreme**  
~\$415 [ca.asus.com](http://ca.asus.com)

To a degree, the CPU you choose will dictate your motherboard. Major manufacturers offer different boards — each with their own strengths and weaknesses — built around CPU choice. To keep things simple and to make sure everything works in unison, we originally planned to use Intel's DQ35JO board, optimized for the E8500 'Penryn' CPU that is the brains of the operation. However, this is not the right board for the application; it seems more suited to powerhouse business machines, not gaming rigs.

Instead, ASUS suggested its Striker II Extreme mobo based on nVidia's nForce 790i architecture as the perfect complement to the GeForce 9800GTX graphics card. It can handle up to four cards in SLI (more on SLI later).





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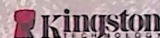
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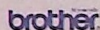
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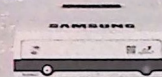
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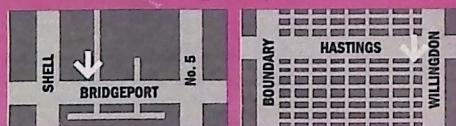


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The board will help to unlock the overclocking potential of the Intel Core 2 Duo E8500 CPU we'll be using in our build. In addition, we could overclock the RAM. In practice, we'll probably do neither; overclocking helps to squeeze every bit of performance out of components and can be accomplished relatively safely assuming an effective cooling solution and a lot of research.

The Striker II Extreme mobo also has a cool two-line LCD panel that alerts to any motherboard issues we may come across.

**CPU**  
**Intel Core 2 Duo Desktop Processor E8500**

~\$320 [www.intel.ca](http://www.intel.ca)

When looking for a gaming PC, Intel is really the only game in town. AMD seems to be focusing more on the mid-range which is valuable in some budget PC configurations but not when you're looking to create a powerful gaming PC. We'll be using Intel's E8500

"Penryn" processor built on Intel's ground breaking 45nm architecture. It is a Dual Core chip with a clock speed of 3.16GHz. Reports from the overclocking community suggest the E8500 can be overclocked to nearly 4.4GHz with just normal air cooling. The

CPU is the brains of the operation but the GPU (graphics processing unit) provides the brute strength, pushing mind melting visual clarity and effects from the latest generation of PC games. As such, the E8500 makes more sense in our application than some of the higher-end CPUs — like Intel's latest Skulltrail CPUs running four cores. Intel Skulltrail motherboards can also incorporate a second Skulltrail CPU for an incredible eight cores running on one board. That's a little out of our price range at the moment however.

**Cooling**

**Thermaltake DuOrb**  
~\$70 [www.thermaltake.com](http://www.thermaltake.com)

A cool PC is a happy PC. "A gaming pc draws a lot of power on the video card and the motherboard," Thermaltake's Koay says. "You have to keep the power constant and the heat down. The more your system heats up, the more the PC is affected," he explains. Cable management is also an important factor in cooling. Aside from giving the Ultimate Game PC a clean and finished look, cable management in the form of webbed cable holders and moderate use of zip ties ensures that airflow through the PC goes unrestricted. The more air flows through the PC case, the

cooler it will be. The cooler it is, the better the performance. Easy. We'll be using the Thermaltake DuOrb CPU cooler that incorporates blue and red LEDs for a bit of flash and, more importantly, two 80mm, 2,000 RPM fans, six copper heat pipes, copper fins and a mirrored copper base for maximum heat dissipation from the CPU.

**RAM**

**Corsair XMS3 DHX TWIN3X2048-1600C7DHX 2GB DDR3 (2 x 1GB)**  
~\$350 x 2 [www.corsair.com](http://www.corsair.com)

Random access memory or RAM is volatile system memory. That's not to say it is apt to explode at any given time but rather, when it's receiving no power it doesn't store anything. RAM is important as it caches system data in a format that can be accessed and processed much faster than is otherwise possible. It's also an important component in PC multitasking and vital in gaming. There are two major types of RAM available. According to Wikipedia's definition they are DRAM (Dynamic Random Access Memory) and SRAM (Static Random Access Memory). SRAM is the faster of the two.

We'll be using two 1GB sticks of Corsair XMS3 DHX TWIN3X2048-1600C7DHX DDR3. Corsair has an excellent reputation for quality components and is a major name and force in performance RAM.

**Graphics card**

**ASUS GeForce 9800GTX**  
\$350 x 2 [www.ca.asus.com](http://www.ca.asus.com)

The graphics card or cards are the centre of the Ultimate Game PC. A powerful graphics processing unit (GPU) is the heart that pumps hyper-real visuals and allows us to bump up the graphics settings on today's most demanding games so we can see them in all their glory, the way the developers intended.

A recent new idea in boosting graphics power allows us to chain two or more graphics cards together to create one monstrous GPU; the dual core of the video card world. ATI calls it CrossfireX and nVidia calls it scalable link interface (SLI) but the core concept remains essentially the same. nVidia's SLI technology can work in several different ways. By either splitting the scene to be processed in two horizontally and dividing the work between two cards (split frame rendering, SFR) or by having each card process frames in sequence with card one doing odd and card two even numbered frames (alternate frame rendering, AFR), GPU performance receives up to a 1.9X boost, according to nVidia data.

We'll be using two of ASUS's GeForce 9800GTX cards each with 512MB video

RAM (nVidia architecture) chained together in SLI for a total of 1GB of VRAM. The cards are PCIe and feature dual DVI outs as well as HDTV out.

An nVidia agreement with many of the major game publishers means that games we run should automatically choose the best mode for our monster GPU setup.

The ASUS GeForce 9800GTX offers a good balance of price and performance and with two in SLI, we should be able to play all current DirectX 10 games at full resolution. At a later date, we could opt to add in a couple more GPUs (in Quad SLI) to about double our already impressive video processing power.

**Sound card**

**Sound Blaster X-Fi XtremeGamer Fatal1ty Professional Series**  
~\$170 [www.creative.com](http://www.creative.com)

A soundcard is not strictly necessary. Many motherboards ship with an integrated sound processing centre and support for 5.1 sound and beyond. The ASUS Striker II Extreme comes with an audio processing centre that's considerably better than most.

However, the fidelity of the sound produced with an integrated sound solution is nowhere near that created through a dedicated sound solution like Creative's Sound Blaster X-Fi XtremeGamer Fatal1ty Professional. Soundcards don't offload instructions to the CPU for processing (the SoundBlaster X-Fi Fatal1ty FPS has a 64MB dedicated audio processing unit, sort of like the audio equivalent of a high-end graphics card in games that support it). When playing with headphones, the X-Fi CMSS-3D Headphone effect spatializes sound to give a sense of immersion. It's like having nine virtual speakers using just a pair of stereo headphones, Creative says. The X-Fi Crystalizer also helps outside of the game; it enhances MP3 and WMA files to intelligently repair some of the damage done to audio files that have undergone this compression.

**Speakers**

**Logitech G51 Surround Sound Speaker System**  
\$200 [www.logitech.com](http://www.logitech.com)

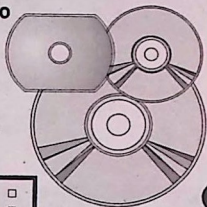
The Ultimate Game PC is the one that offers the most immersive game experience. To that end, we could go all out and opt for a 7.1 speaker system — that's left and right channels for each of front, middle and rear, a centre front speakers and a subwoofer for low frequency effects (LFE). However, 7,1 is perhaps a little extreme for our application. 7,1 surround seems a bit like overkill and would essentially require the Ultimate Game Room to house the Ultimate Game PC.

We're opting for Logitech's 5.1 G51

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speaker system. It's got 155W of power, bone rattling bass and a handy remote control unit that sits on the desktop. As important as the performance when building the ultimate is the look. To that end, the G51 speaker system looks great out of the box and Logitech offers a unique skinning system that allows users to change the look of the satellite speakers. Print outs slip in to designated channels on the outside of satellite speakers to carry art from a favourite game or anything you can dream up ([www.logitech.com/G51skins](http://www.logitech.com/G51skins)).

Monitor  
LG L246WH  
~\$500 [www.lge.ca](http://www.lge.ca)

Major manufacturers all have gaming-oriented LCD panels. Thanks to the drastic improvements in LCD response rates (measured in milliseconds) and improvements in LCD panels' ability to show a full contrast range from true blacks to pure whites, the CRT is finally (almost) dead in North America. Look for a panel with a fast response time (no more than 6ms, some panels go as quick as 2ms), a high contrast ratio and good brightness range. Choose a widescreen panel of at least 19" but realistically speaking, 22" plus. Bigger is definitely better in this case. The display is one of the components you really need to see and play with in the store; no online buying here. We're going to go with the LG L246WH high def LCD Monitor. LG's L246WH offers a 5ms response, 2000:1 contrast ratio, 1920x1200 (WUXGA) resolution and

HDMI in for connection high-def sources. And more important, it looks really good.

Coupled with the Blu-ray / HD-DVD drive, we'll also be able to enjoy high def video sitting at our desk... until the time comes to give the Ultimate Game PC away.

Power supply  
Thermaltake ToughPower 1000-Watt  
~\$305 [www.thermaltake.com](http://www.thermaltake.com)

The power supply unit (PSU) is the unsung hero of your PC. Do you need a 400W or 1.21 gigawatts? What's the difference? And how much is it going to cost? Think of it like the engine in a car, says Thermaltake's Koay. A good engine pushing the car along at 120 KM/h runs smoothly and gracefully. Running the same 120 KM/h using a low end engine you can still reach 120 KM/h without much of an issue, but the ride won't be anywhere as smooth and you won't be able to go much faster. To determine your PSU requirements, use

an online powersupply calculator, Koay says, like the one hosted by Newegg.com at <http://educations.newegg.com/tool/psucalc/index.html>. Leave a 20 per cent power allowance for your PSU; assume all components are running at 100 per cent load and add some cushion.

#### Before we begin

Deciding which components to use is perhaps the most difficult part of building a balanced PC. We tried to balance price and performance in our Ultimate Game PC but leaned toward the latter. There are capable gaming rigs that can be built with less money and there are certainly more powerful rigs that can be built with more. We welcome your feedback on the PC build. Stop by [www.hubcanada.com](http://www.hubcanada.com) to get in on the discussion.

By Andrew Moore-Crispin

Next month: We begin assembling the Ultimate Game PC and try (hopefully that's not the operative word) to boot it up for the first time. In the third and final installment of Building the Ultimate Game PC in our July issue, we'll be loading up games for some play testing and benchmarking our rig. In August, we'll be giving the Ultimate Game PC away to one lucky reader.

Visit [www.hubcanada.com](http://www.hubcanada.com) to comment and for a chance to win the Ultimate Game PC!

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# Game Gear pt. 1: Gaming Keyboard Roundup

*Hitting all the right buttons*

Just like a curler wouldn't wade bravely into battle without his best broom, how can any self-respecting gamer not want to outfit him or herself with the finest gear before valiantly waging virtual combat?

In the next few issues, we take a good, long gander at PC gaming peripherals. This issue, we focus on game-oriented keyboards — full keyboards for the most part that are also equipped with a variety of added controls and features that help you shoot the bad guys a wee bit faster or fly your plane just a wee bit better.

What can you expect a gaming keyboard to do for you? Though the marketing blurbs of most models claim faster response times, lower latency, and other characteristics measured in milliseconds, the truth is that in general "casual" play, any decent keyboard is fast enough. Instead, the real draws for gamers are the sleek, slightly menacing appearance, the extra keys and controls, the macro ability (macros are multiple commands or actions automated into a single keystroke, usually for added speed or convenience within a game), and keypad backlighting. As an added bonus, many mid- and high-end gaming keyboards are of high enough quality to also be considered exceptional non-gaming keyboards. Ultimately, the better models bring so much to the table that they seem to make a good deal of sense even if you're not a gamer.

We tested four of today's most prominent models — three of which follow traditional methodology and one, the dwarfish Belkin n52te, that says, "Hey, you don't need an entire keyboard for playing games." All the units we auditioned are corded, which is fair enough. No one wants to lose a game due to slow or problematic cordless reception, and there probably aren't many serious PC players who use a keyboard anywhere other than their desk. All feature at least some degree of backlighting — which, when correctly implemented, is an exceedingly nifty and useful characteristic — and every model but the tiny Belkin

sports retractable legs on the rear to tilt the keyboard toward you.

So without further ado, we present the contestants, arranged in order from least to most expensive.

## Reclusa

Microsoft [www.microsoft.com/hardware/gaming/](http://www.microsoft.com/hardware/gaming/)  
Street Price: \$60

A joint venture between Microsoft and gaming peripheral maker Razer, the Reclusa is a superb keyboard for regular computer use and casual gamers, but lacks some of the amenities hardcore players appreciate. There's nothing, however, wrong with its price — it's the most affordable of any keyboard in this roundup.

Definitely sizable at 53.3cm by 21.6cm, and even bigger with the enclosed wrist rest attached, the Reclusa is curious in that it doesn't make better use of its depth. Though a large dust guard sits over the rear two inches of the board, the guard doesn't flip open to reveal more controls as you might think it would.

In terms of controls, the Reclusa sports nothing out of the ordinary until you get to the far left and right edges of the unit. But those extra four inches are very valuable real estate. On the left, you'll find three raised keys (like standard keyboard keys), two more buttons that sit flush with the cowling, and a single rotary dial. On the right side is a mirror image of that same grouping. These controls are, by default, used for Internet, email, document, and media player access, but they can be programmed to become anything you want them to be — including macros. Unfortunately for macro fanatics, there is an eight-keystroke macro limit (versus the sixteen-keystroke max of Razer's Lycosa, for example).

In terms of straight-up keyboarding, the Reclusa feels wonderful. There's just something about Microsoft's high-end keyboards — a combination of good key spacing, key definition, and action — that makes them a pleasure to use. At the end of our roundup, this is

the keyboard we most wanted to get our hands on again.

The unit's backlighting certainly adds to its appeal. Unlike Razer's Lycosa, which is plagued by questionable design decisions that hamper character visibility, the Reclusa's keytop characters are visible in any condition. When switched on, the bright blue backlighting shines through the characters and bathes them from underneath. When the backlighting is switched off, the characters remain visible for the simple reason that they're white and the keys are black.

The only keyboard in this group to have no audio ins or outs, the Reclusa does sport two USB pass-thru ports. Unfortunately, those ports are USB 1.1 rather than 2.0, thusly compromising the speed of large storage devices and the like. Moreover, the Reclusa won't allow you to disable the dreaded Windows Start key — bad news for hardcore gamers because inadvertent triggering of the key can impact an otherwise good gaming session.

## n52te

Belkin [www.n52te.com](http://www.n52te.com) Street price: \$65

We've already identified the most obvious detractor of Belkin's n52te and we haven't even begun discussing it. It's the price. At \$65 or so, it costs just as much as some of today's best full gaming keyboards, and it certainly isn't a full keyboard.

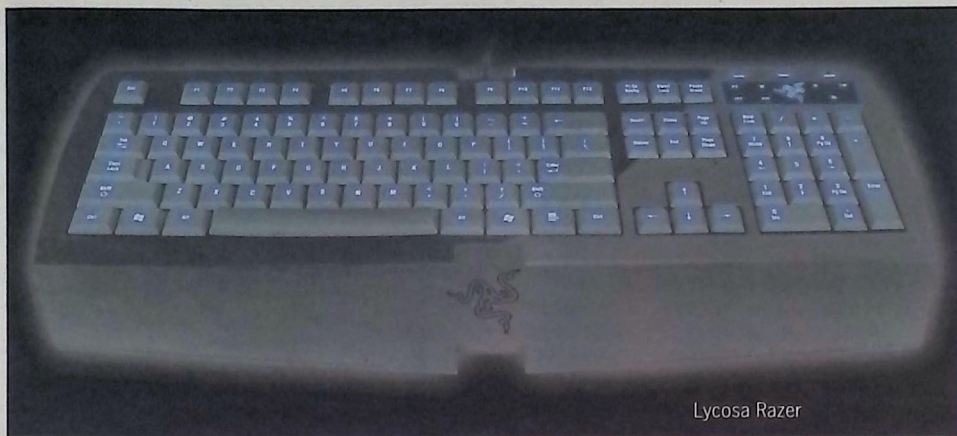
What it is is a keypad. Actually, it's quite a bit more than that. It's a fifteen-key keypad with a scroll wheel, an eight-way directional pad, an extra button, and an ergonomically sound palm rest. Designed to replace the standard keyboard during gaming sessions, the n52te puts every control you'll ever need — and more — directly under your left hand, so you're never again forced to stretch for anything.

With its blue backlighting, illuminated scroll wheel, and slick styling, the n52te looks eminently cool — particularly in a darkened room. And it feels wonderful,



Saitek Cyborg





Lycosa Razer

conforming nicely to the natural lay of your hand and fingers. The fourteen keys on the keypad are highly responsive, extremely accessible, and ready to be programmed with individual keystrokes or whatever massive macro you can dream up. And certainly Belkin seems to have eliminated earlier stability problems where the unit would lift off the desk in the heat of action.

However, we're not so thrilled with some of the amenities. The directional pad, for example, is difficult to reach and even more difficult to manipulate in the desired direction, especially if you have smaller hands and even if you detach the near-useless mini-joystick. Furthermore, the fifteenth key (located just below the directional pad) is attached in such a way that you must press it precisely in the center or risk a misfire. And the scroll wheel, though positioned in just the right spot, is hard to spin without first lifting your fingers from the keys for added leverage.

Ultimately, we don't feel the unit's upside makes up for the miscues — or its somewhat hefty price tag. However, feel is a very subjective thing. If you like the concept, and are either endowed with large hands or open to an acclimatization period, you should certainly try to get your hands on one for a test session with your favorite game before rendering a decision.

**Lycosa**  
**Razer** [www.razerzone.com](http://www.razerzone.com) Street Price: \$80

The sleekest and likely the prettiest keyboard in this roundup with its glossy, piano black finish and low-slung, understated styling, Razer's Lycosa isn't quite so appealing under the hood.

The little brother of Razer's Tarantula, the Lycosa has

the slimmest keycap structure, the shortest action, and the quietest operation of any board here, and thus feels much like a laptop keyboard. Its comparatively diminutive size (just 47cm by 16.5cm) makes it feel less substantial than the others, though it's certainly a better fit for smaller desks.

The Lycosa's cool blue backlighting shines through the characters on the keytops but not between the keys, and is so dim that the characters disappear in bright ambient lighting unless you're looking straight down at the keys. Moreover, because the characters are transparent rather than translucent white, the entire keyboard and all the keys fall completely black if you switch off the backlighting. An alternate setup allows you to illuminate just the WASD keys, but overall the lighting leaves us in the dark.

A compact touchpad at the top right controls the backlight and your media player (the unit supports four of today's most popular media players right out of the box), and deactivates those annoying Windows Start keys, yet the touchpad's sensors wouldn't always acknowledge our touches. We also had issues with key modifiers such as Shift and Ctrl, both of which worked only intermittently. A quick scan of Internet chat boards proved we aren't alone.

The Lycosa's keytops sport a non-slip rubberized coating that feels quite different from most keyboards, and the unit packs headphone and microphone jacks and a USB pass-through port on the rear. Sadly, the port operates at leisurely USB 1.1 speeds. The wrist rest is of the screw-on variety, meaning you'll need to remove all four screws just to detach it.

In the end, you have a slick looking, space-efficient keyboard that offers some gaming-specific perks but

has lighting issues and may have quality problems. That's not quite enough.

**Cyborg**  
**Saitek** [www.saitek.com](http://www.saitek.com) Street Price: \$100

A big keyboard at 53.3cm by 20.1cm, the Saitek Cyborg is the newest and priciest of all the models in this group. But it's also one of the most intriguing, and it definitely offers the most features.

The Cyborg has a lot of things going for it, not the least of which is its light show. Like the Reclusa, the Cyborg's backlighting shines both through the characters and between the keys and is therefore highly effective. Even better, the colors are switchable — from green to amber to orange to our favorite, a bright red. Moreover, you can dim the light, brighten it, switch it completely off, and even select different colors for different segments of the board. For example, you can choose green for the WASD keys and red for the numeral keypad, leaving everything else in the dark. And you'll do all that via a touchpad that, unlike that of the Lycosa, works correctly every time.

The gaming-centric controls (hinged buttons, actually) appear on the extreme left and right edges of the board — six on each side, in a row from top to bottom. Each of these controls may be programmed to perform any operation you want them to perform, including macros, via the included but slightly imposing Saitek SST software. As good as this sounds, we had minor problems during game sessions differentiating one button from another because they're grouped so tightly together. Moreover, we felt the action of each was slightly sloppier than that of the Cyborg's keys.

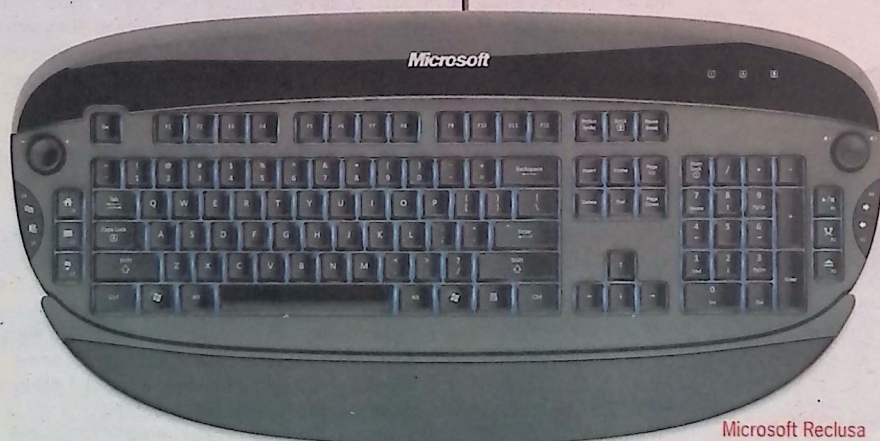
Despite — or perhaps because of — its amenities, the Cyborg looks rather gaudy, like a prop from a Terminator flick. That isn't necessarily a bad thing, particularly for true gearheads, but it certainly doesn't look as chic as either of the other two full keyboards we review here. Its key action is solid though, trailing only the Reclusa in this regard, and its metal-plated WASD, cursor, and space keys should add to longevity. We liked the extra two retractable legs on the front, which, when extended in conjunction with the back legs, elevates the entire board off the table or used alone, provides a more ergonomics friendly negative tilt. And we loved the dual modes — "Normal" and "Cyborg" — the latter of which automatically disables the Windows Start keys.

The Cyborg features a single USB pass-thru port (the Reclusa has two), but the really good news is that this is the only keyboard we tested that supports the far faster USB 2.0 standard. You can also plug in a mic and a headset.

**And the winner is...**

If you have the bucks and really love your gaming, Saitek's beefy Cyborg is definitely where it's at. If you're not flush with money but appreciate a great double-duty board with superb tactility and most of the features gamers value, Microsoft's Reclusa is an exceptional choice. Belkin's n52te is more subjective, but may be a good fit for those who like the idea of a compact, standalone command post, while Razer's Lycosa simply isn't as impressive as it initially looks. Now get going — there's an entire world just ripe for the fragging.

By Gord Goble



Microsoft Reclusa



# In the Lab: Graphics Card Roundup

*Finding the perfect balance of price and gaming performance*

Whether it's the release of next-generation consoles, Windows Vista's higher than normal graphics requirements, or that integrated graphics have improved significantly in the last few years, the cost of discrete graphics hardware has come down substantially over the past two hardware refreshes. While there are still ultra-end \$500+ graphics solutions out there, they're becoming increasingly uncommon. Nowadays, it isn't out of the ordinary to find adequately powerful mid-range hardware between \$100 and \$150 with high-end hovering around the \$250 mark. And with nVidia's SLI and AMD's CrossFireX, multi-card solutions have made for a quick and easy option to increase the performance of your setup after your initial purchase.

When it comes to PC gaming the graphics card is arguably the most important aspect of your system (with CPU and RAM not far behind). The trick to buying graphics hardware is to find a solution that meets your performance needs and graphics technology support, but that is still within your price range. Fortunately the graphics hardware manufacturers have been nice to us in this regard as they tend to offer the same graphics core at different speeds, modifying the cost of each accordingly. This allows us to purchase a graphics card that supports the same technology (from something small, like HDR support, to something big, like fulfilling the DirectX 10 (DX10) requirements), at vastly different price points.

Being that this issue is all about gaming, we've decided to look at a few of the more common options available from graphics processor heavyweights, nVidia and AMD (formerly ATI). What's interesting is that while this report's focus leans more on the mid-to-high scale of the graphics hardware range (which is fitting for a PC gaming), even the entry-level variants of these cards support most, if not all, of the same technology. Things like hardware accelerated HD playback, DX10 support, etc., are present in even the \$50 cards based off of this generation's tech. Cool!

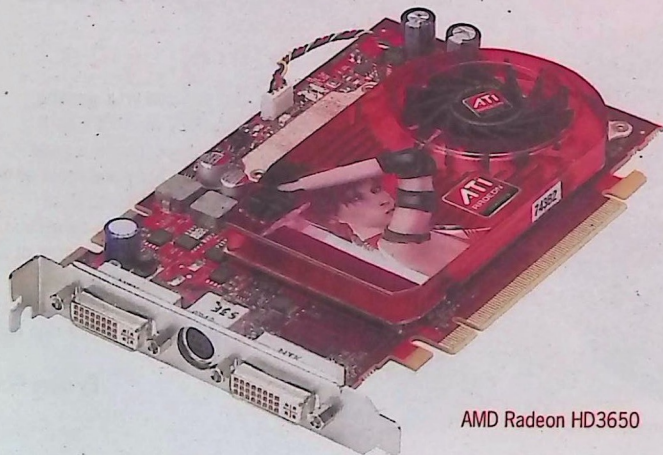
## AMD Radeon HD3650

**www.AMD.com** Price: ~\$100 Category: Mid-Range Memory: 256MB  
Output: Dual DVI (HDCP compliant), Video-Out Interface: PCIe 2.0  
Multi-Card Support: Yes

The built-by ATI card we used for testing has two DVI ports (dual-link) as well as a video-out port for both composite HD and S-Video output. Surprisingly the card also supports HDMI with 5.1 audio by using the supplied DV-to-HDMI converter. While I didn't test it out first hand, it's good to see that AMD is continuing to include the digital connection as it has become the de facto standard for digital high-definition output.

The card itself is pretty plain and unassuming — it's a small board, uses a single slot, actively cooled heatsink, and is built on a traditional ATI-red PCB. Memory configurations will probably be the most easily distinguishable feature between the different manufacturing partners' boards since HD3650-based cards range between 256MB and 1GB of memory (with cost scaling as you'd expect). The only other point of interest on the hardware itself is the two CrossFireX connectors on the topside of the PCB.

Using ATI's RV670 core means the HD3650 is made on a 55nm fabrication process, reducing power consumption and generating less heat than the 65nm of



AMD Radeon HD3650



Sapphire Radeon HD3870

previous ATI and nVidia cores. Taking advantage of both DX10.1 and OpenGL 2.1 means the card can run even the latest pixel effects and shaders. With a core clockspeed of 725MHz and a memory clockspeed of 1.6GHz, the HD3650 has a decent amount of pixel pushing horsepower, but it probably doesn't have enough memory bandwidth to run the latest games at high resolutions or with anti-aliasing enabled at an acceptable speed. Overall the HD3650 is an adequate card especially when you consider that some variants and OEM versions come with a very encouraging sub-\$100 price tag.

## Sapphire Radeon HD3870

**www.sapphiretech.com** Price: ~\$250 Category: High-End Memory: 512MB  
Output: Dual DVI (HDCP compliant) Interface: PCIe 2.0 Multi-Card Support: Yes

Like the 3650, the HD3870 uses the RV670 core meaning it's a 55nm part. However, due to the card's higher power requirements, it needs its own dedicated power connection (a converter cable is included in the box) whereas the 3600 series doesn't. The HD3870's clockspeeds are substantially higher than the HD3650 as well, blazing in at 775MHz for the core and a whopping 2.25GHz on the memory.

As far as design goes, the HD3870 shares many of the same layout characteristics of the HD3650. Both of them not only have two DVI ports (supporting HDMI with 5.1 audio), but also two CrossfireX connectors on the top of the PCB and a video-out port for composite HD or S-video output. The major differences between the two is that the HD3870 is significantly longer, requires a dedicated power line (as mentioned), and uses a dual slot heatsink, effectively eliminating the interface slot next to the graphics card. There are versions of the HD3870 that ship with a single slot cooling solution, but they cost more than the standard design.

## eVGA eGeForce 8600GT

**www.eVGA.com** Price: ~\$100 Category: Mid-Range Memory: 256MB  
Output: Dual DVI (HDCP compliant) Interface: PCIe 2.0 Multi-Card Support: Yes

Admittedly, nVidia's GeForce8 series is getting long in the tooth but the eVGA e-GeForce 8600GT 256MB is priced to move, with some versions falling into the sub-\$100 category. This also puts it directly in the crosshairs of AMD's much newer HD3650. With a core clock of 540MHz and memory humming along at 1.4GHz the 8600GT's core clockspeed is considerably lower than the HD3650's.

The card's design is also pretty minimal. Single slot cooler, small PCB, two DVI ports for dual-link, video-out port, and an SLI connector up top. It's up to the board





Gigabyte GeForce 8800 GT

manufacturers to decide whether their 8600 cards support HDCP. Unfortunately, eVGA went without HDCP compliance with their stock 8600GT, so any high definition content being shown through a digital display that uses signal security (Blu-Ray or HD-DVD) will be limited to enhanced definition and not true HD. While this may be a non-factor for the majority of computer users, it's still worth mentioning if only as fair warning.

On paper, while the 8600GT seems similar to that of the higher priced 8800GT, the most crippling difference between the cards is in the graphics memory bus size. The 8600GT has a 128bits wide memory bus whereas the 8800GT's is 256bit, doubling the cards memory bandwidth clock for clock. If there is a bottleneck in the card that would be it and it would hinder performance at higher resolutions.

#### Gigabyte 8800GT

[www.giga-byte.com](http://www.giga-byte.com) Price: ~\$250 Category: High-End Memory: 512MB

Output: Dual DVI (HDCP compliant) Interface: PCIe 2.0 Multi-Card Support: Yes

Due to its impressive price/performance ratio, nVidia's 8800GT is one of the most popular GPUs today. The 8800GT is almost identical to its bigger brothers the 8800GTS and 8800Ultra. In fact, in a lot of real-world tests the 8800GT pushes the same amount of frames as the 8800GTS, while still being \$100 cheaper. Not bad! Making the Gigabyte card better is that it's clocked a full 100MHz higher than the standard 8800GT GPU running at 700MHz instead of 600MHz. The memory has also been given a 40MHz boost, clocked at 1840MHz. As mentioned, like the HD3650 and 3870, the memory bus width is 256bit, ensuring a great level of throughput.

The Gigabyte 8800GT also uses a non-standard dual slot, orb-style heatsink. This should help keep the GPU cooler than the traditional fan unit (normal 8800GT-

based cards ship with a single-slot cooler.) Personally I'm all for more cooling as it should help with overclocking, but if you're building a home theatre PC (HTPC) or a smaller form factor PC, you may not have the additional room needed to house a thicker than normal cooler (same goes for the HD3870).

Furthermore, 8800GTs with the standard cooler are generally cheaper, though they won't be clocked as high out of the box.

Like the HD3870, the 8800GT requires a dedicated power source, comes with video-out, has two dual-link capable DVI ports (which support HDCP, but not audio), and has an SLI connector for multi-card support. Gigabyte's latest version of the 8800GT claims to use high-quality capacitors and MOSFETs. Dubbed "Ultra Durable 2," with all the parts combined, Gigabyte's card is supposed to run cooler, with more stability and durability, lasting longer in the process. Whether or not it is necessary or has any tangible benefits remains to be seen, but for the price of the card we're not complaining.

#### The Numbers:

FutureMark's 3DMark06 is top dog when it comes to synthetic benchmarks. While it's not necessarily a real game (although they are selling their upcoming engine as middleware for game development), for comparison purposes it does a fine job. 3DMark06 stresses every major area of a GPU (and system in general) and sums it up in single score.

AMD HD3650: 4869 eVGA 8600GT: 4719

Sapphire HD3870: 8955 Gigabyte 8800GT: 9624

Crysis is easily the most graphically demanding game available to date. Even when running quad-card SLI or CrossfireX setups (four cards running in tandem) at the higher settings it can still cause a slideshow. Even at modest medium settings it hammers the mid-range cards in our test. Measured in frames per second (FPS).

AMD HD3650: 21.5 eVGA 8600GT: 14.1

Sapphire HD3870: 34.1 Gigabyte 8800GT: 32.6

Considering how many games available (or in development) use Epic's Unreal Engine 3, including Unreal Tournament 3 benchmarks in the round-up seemed like a good idea. Not only does the game require a fast framerate to ensure the highest possible frag-count, but it's visually stunning too. Measured in frames per second (FPS).

AMD HD3650: 62.5 eVGA 8600GT: 55.2

Sapphire HD3870: 105.5 Gigabyte 8800GT: 123.2

## Glossary

**Integrated Graphics:** A graphics processing centre built in to the motherboard.

**Discrete Graphics:** An add-in graphics processing card or component.

**PCB:** Printed circuit board, a substrate with all the electrical connection and routing points already etched, eliminating the need for physical wiring.

**HDRR:** High Dynamic Range Rendering. A lighting model used to create more realistic scenes in interactive entertainment.

**DirectX 10:** Microsoft APIs that dictate how multimedia tasks, and most specifically, game programming, are handled on Microsoft platforms.

**CrossFireX:** ATI's solution for bridging multiple graphics cards and sharing the graphics processing load equally between them.

**SLI:** nVidia's solution for bridging multiple graphics cards and sharing the graphics processing load equally between them.

**OpenGL 2.1:** Open Graphics Library. A standard specification API that affords a simpler interface to designers; uses "primitives" (lines and points) to construct 3D scenes.

idSoftware's lead programmer, John Carmack, has a knack for making state of the art graphics engines. The company's latest release, Enemy Territory: Quake Wars is no different, being the first game to use his MegaTexture technology. The game engine uses the platform-independent OpenGL graphics API, so ET:QW serves to diversify our tests (the rest of the tests rely on DirectX as their API). Measured in frames per second (FPS).

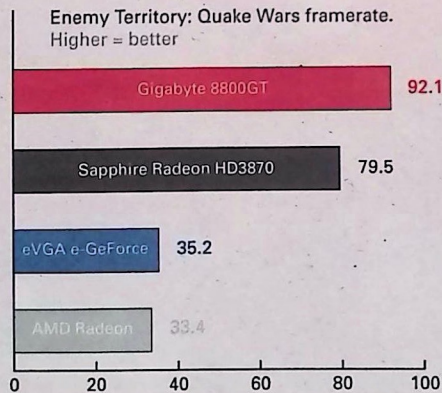
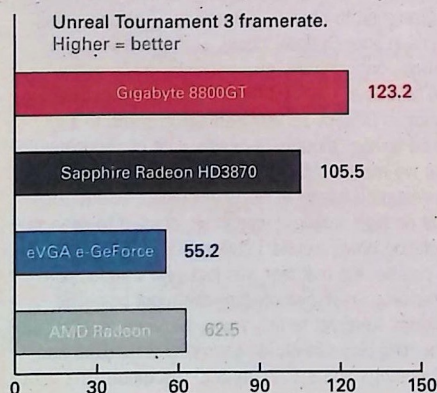
AMD HD3650: 33.4 eVGA 8600GT: 35.2

Sapphire HD3870: 79.5 Gigabyte 8800GT: 92.1

#### Conclusion:

Worth mentioning is the fact that nVidia have just recently launched their GeForce 9 series graphics adapters. With that in mind, it may be a good idea to hold off on a graphics card purchase until we've seen exactly what the GeForce 9 series can do. The effect of the GF9 series launch will be two-fold — first, it should outperform equivalently priced cards of the GeForce 8 series and second, it will drive down the cost of current hardware (saving you money if you still choose to go with a GeForce 8). Deciding on a mid or high-end card is a tough decision; AMD and nVidia make the vast majority of their profit selling mainstream hardware, not from their ultra-high-end, extravagant, and massively expensive cards. It's no surprise that many of nVidia's and AMD's manufacturing partners have a few different versions of the same GPUs bundled differently in order to entice consumers. Keep that in mind when videocard shopping, as chances are you'll be able to find a no-frills version of the same card at a cheaper price. With the exception of the 8600GT, we have a very linear performance scale. This is a good thing if you know exactly how much money you want to spend but could make your purchase decision that much more difficult if you have no set budget. While the numbers changed when we moved to higher and lower resolutions, the proportions remained similar. In that respect it looks like the HD3650 trumps the 8600GT in every respect, with the 8800GT keeping ahead of the (newer) HD3870.

By Mike Palermo





# Power Pellets: Multiplayer Still Massive

*In the realm of MMORPGs, World of Warcraft still reigns supreme*

*Competition is heating up in the world of massively multiplayer online role-playing games, but Blizzard's three-and-a-half year old — and still absurdly popular — fantasy game has little to fear*

Blizzard Software announced earlier this year that World of Warcraft, its extraordinarily popular massively multiplayer online role-playing game (MMORPG) had reached a dumbfounding milestone: 10 million active subscribers worldwide. If that doesn't break your brain, consider this: With subscriptions priced at \$15 per month, Blizzard is raking in revenue of nearly \$2 billion per year — and that doesn't include profits from sales of the core game or its expansion pack.

As some analysts have rightly noted, Blizzard's business model is now less that of a traditional game developer and publisher, and more one of a utilities company — and a sizeable one at that.

There's no other game to which World of Warcraft can properly be compared. The just-released Grand Theft Auto IV, which many analysts are anticipating will become the best selling console-based game of all time, was, at the time of this writing, expected to sell about 5.8 million copies in its first week, bringing in \$360 million. If it sells 15 million copies through December — a generous but plausible projection — it will still only have earned less than half of what World of Warcraft will make in subscriptions alone this year.

Of course, World of Warcraft wasn't the first massively-multiplayer online game, but it is the first to prove the genre's potential for extraordinary popularity and profitability. MMORPGs have been around in one form or another for more than two decades, beginning with the rudimentary text-based CompuServe game Island of Kesmai in 1984. But it wasn't until the advent of the modern Internet and 3D games like Ultima Online, Lineage, and Everquest, which were developed

in the late 1990s, that MMORPGs started to gain a sizeable following, attracting hundreds of thousands of users first in Asia, and later in Western countries.

Still, nothing prepared the gaming industry for World of Warcraft's unparalleled global success. And now that it's happened, everyone wants in on the action. Several high profile games within the genre (The Matrix Online, Dungeons & Dragons Online, Tabula Rasa) have been released over the last few years, and more are on the way. But the World of Warcraft phenomenon has proven hard to replicate.

Last year's The Lord of the Rings Online bowed to critical praise, but only attracted around 300,000 active subscribers in its first six months, according to data collected by the social game network VOIG.com (Turbine, the game's developer, has a policy of not releasing subscription numbers). But despite its relatively tiny slice of the pie, Lord of the Rings Online is still recognized as the second most popular MMORPG played in Western countries — which we can take as further testament to World of Warcraft's utter dominance.

The next challenger to World of Warcraft's throne is the highly anticipated Age of Conan: Hyborian Adventures, five years in the making and finally due out this month. The first MMORPG to employ Windows' DirectX 10 API, this graphically sumptuous, M-rated game has been earning very warm previews from the gaming press. In an attempt to lure new players to the MMORPG realm, Norwegian developer Funcom has designed Age of Conan to be played as a single-player experience until characters reach level 20, at which

point they can quest online. This strategy has the potential to attract players new to the genre by setting at ease the anxieties of players who typically fret over online play. On the other hand, that M-rating could keep the game out of the hands of mid-teens, who make up a large chunk of the MMORPG audience (these time-sucking games require an enormous amount of free time, which teenagers have plenty of).

Another notable upcoming MMORPG is Electronic Arts' Warhammer Online, which has high expectations if for no other reason than that the fan base of the Warhammer tabletop games is known to overlap with followers of the Warcraft universe. It's slated to hit shelves around the holidays.

But will Warhammer, Age of Conan, or any other upcoming MMORPG pose a serious threat to World of Warcraft? Probably not. At this point World of Warcraft has such an enormous (and enormously loyal) user base that its competitors are little more than mosquito-like nuisances. However, the good news for these and other upcoming MMORPGs is that, with subscriber rates at \$15 per month, accounts don't need to be measured in the millions to make the game a success.

## Area51 m15x

High-end gaming notebooks have a bad reputation for being huge and heavy machines not meant to be lugged around except in case of emergency — like, say, a last minute invitation to an all-night LAN party. Alienware's powerful new Area-51 m15x takes a step toward changing that perception by delivering crazy horsepower in a relatively portable 15.4-inch book that weighs just 3.5kg — still hefty by regular notebook standards, but more manageable than the five kilo behemoths that hardcore gamers have previously been forced to mule about.

The m15x is the first notebook in its size class to use Intel's Core 2 Extreme X9000 chipset (our tricked out evaluation model had a 2.8GHz processor with 6MB Cache 800MHz FSB) and sport one of NVIDIA's unparalleled GeForce 8800M GTX cards. Add 4GB of dual channel DDR2 RAM and 1GB of Intel TurboCache memory (extra RAM that keeps frequently used data always at the ready) to further speed up things, and you've got one powerful portable PC.

And a pretty one, too. The m15x is decked out with all of Alienware's signature trimmings, including customizable lighting effects (we love the glowing keyboard and piping around the monitor, which can be programmed to change in intensity when new email arrives in your Outlook inbox), chic touch-sensitive controls, and smooth, glossy finish.

But how does this beast play games? Gears of War running in DirectX 10 with settings cranked to high looked terrific, though there was a bit of choppiness once we maxed out the resolution to 1920-by-1080. The resource intensive World in Conflict also looked great on high settings, though we needed to keep the resolution down around 1280-by-800.

Of course, the real test was last year's impossibly demanding Crysis, which even the most powerful desktops have yet to fully tame. We were able to coax something playable out of a mixture of medium and high settings and a 1280-by-800 resolution. The Very







High settings, accessible only on DirectX 10 machines, were, unfortunately (but not unexpectedly), pretty much untouchable.

Still, the m15x is perhaps the powerful 15.4-inch notebooks currently available — as it should be, given its sky-high \$4,858 price tag. It's difficult not to feel just a little disappointed that it can't run all of the latest games at maximum fidelity, but, since no existing notebook can, it's hard to begrudge it on that basis. Definitely worth a close look for luxury laptop fans.

By Chad Sapieha

Chad Sapieha is a Toronto-based journalist and frequent contributor to a variety of North American news, technology, and lifestyle publications.

Power Pellets is a monthly column that explores PC gaming products, services, trends, and issues, focusing, when appropriate, on Canadian consumer ramifications and industry connections.

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# Get in the game: Buying a gaming Laptop

*Finding the right mix of price and performance*

When it comes to buying a laptop designed to handle today's demanding computer games, there's good news and bad news.

Let's start with the unfortunate reality — the latest PC games require a fast processor, ample RAM and a high-end video card.

But despite popular belief, you don't need to take a second mortgage out on your home in order to afford one.

So consider this article a starting point on what to look for in an affordable mobile gaming PC, component by component, whether you're looking to frag friends in online deathmatch tournaments while at your local café or simply a way to stay entertained while flying the friendly skies.

The following is a look at the various components to shoot for when shopping for a reasonably-priced gaming PC. Keep in mind components improve all the time, but here are some recommended specs at the time of writing.

## The CPU

A PC's CPU — or Central Processing Unit — is the brains of the machine. While we're starting to see quad-core processors in desktop PCs, you'll be just fine with a laptop powered by a dual-core CPU, such as an Intel Core 2 Duo or Intel Core 2 Extreme processor, with 6MB Cache and 800MHz front side bus. The PC version of Ubisoft's "Assassin's Creed," for example, recommends an Intel Core 2 Duo 2.2 GHz or AMD Athlon 64 X2 4400+ or better.

## System memory

As with the CPU, system memory (a.k.a. RAM) is related to the speed and performance of your computer, plus it helps users run more than one program at once. Because games require a lot of

memory to run smoothly, make sure you more than meet the minimum requirement for your favourite titles (good news: prices have dropped considerably over the past couple of years). While you can get up to 4GB of RAM with some of today's gaming laptops, 2GB of DDR2 RAM is fine to start. Stardock's "Sins of a Solar Empire," for instance, requires 512MB RAM (or 1GB for Windows Vista), while 2K Games says 2GB of RAM is ideal to run "BioShock."

## Video card

One of the most important considerations when buying a laptop for 3D gaming is its video card and amount of video RAM (VRAM) on the card. Never opt for an on-board ("integrated") video card — a gamer needs a dedicated stand-alone one for optimum performance. This is where things can get a tad pricey, so if you can't afford an nVidia SLI Dual GeForce 8800M GTX with 1GB GDDR3 Memory (gulp!), then a 256MB or 512MB graphics card will be fine for most games. Ubisoft's "Tom Clancy's Rainbow Six Vegas 2," for instance, calls for a minimum of 128MB DirectX-compliant video card but recommends at least a 256MB DirectX-compliant video card.

## Hard Drive

As with RAM, hard drive space has also come down in price over the past few years. The more you have, the more games, programs and files you can store on your computer. A laptop typically ships with at least an 80GB or 120GB hard drive, but you can spend a little more for a 200GB, 320GB, 500GB or 640GB hard drive. Remember hard drive have speeds too, so the higher the number the better (7,200 RPM, or rotations per minute, 5,400 RPM at the least). Some newer laptops have Flash-based SSD — Solid State Drives — but while you might gain a speed boost they don't



store a lot of data yet (usually 64GB). EA's "Hellgate: London" takes up 6GB of hard drive space, while Ubisoft's "Assassin's Creed" for the PC takes up 8GB.

## Other considerations

- When it comes to audio, today's games may feature a number of bells and whistles — such as 7.1 surround sound that splits audio into seven different tracks, plus the bass via the subwoofer — but don't bother investing in one of these fancy mobile audio cards (from, say, Creative) if you're counting your coins. A decent 2.0 system with headphone jack should be fine for most.
- No PC games ship on Blu-ray Disc just yet so be sure to get a fast DVD drive (with recording function), such as a 8x dual-layer CD-RW/DVD±RW.
- Screen size boils down to personal preference but let's face it: the bigger the better. A 17-inch or 20-inch laptop screen trumps a 13- or 15-inch monitor, but the downsides to a bigger screen are twofold: it'll add extra size and weight to the PC and generally speaking will eat away at the battery faster (though you shouldn't expect great battery life anyway, since running games is taxing on the laptop's resources!). You can always output to a stand-alone PC monitor or supported HDTV, too, if you like.
- Be sure to buy a PC with Windows Vista as it's been optimized for gamers with the latest DirectX and other bells and whistles.
- Any laptop you buy today should have a decent network adaptor installed so you can connect to the Internet wirelessly while in a hotspot, but be sure to look for built-in 802.11n for fast speeds and greater range, when paired with a compatible wireless router.
- Game pads, flight sticks and steering wheels can be added any time you like so don't include it in your budget. Just invest in a decent wired gaming mouse, preferably with programmable buttons. On that note, be sure to buy a laptop with many USB 2.0 ports so you can add many peripherals, if need be.
- Consider aesthetic options such as funky colours and tattoo designs as it'll add some personality and pizzazz to your gaming laptop.

By Marc Saltzman



Dell XPS M1730



# The Last Byte: The New Ultraportable

*The best ultra-mobile computer is your phone*



Ultra mobile computing has had a long haul. The segment has seen flashes of success — both Palm and Mobile Windows had their moment in the sun — but nothing remains of those that you could call pervasive on the same order as the ubiquitous personal computer. If you take the ultra-mobile out of the context of PC evolution, however, you can see that the tiny computer is alive and well and living in your smartphone.

Smartphones have quite a different evolutionary history than handheld computers but they are converging on a common playing field. Phones figured largely in the demise of standalone handhelds. The first Treo, which was a combo Palm and cellphone proved to be more desirable than the Palm alone. Likewise, the only Mobile Windows devices with any legs in the market today are those that are cell phones.

Nevertheless, market research firm Canalys considers smartphones and wireless handhelds as a single market segment it calls the smart mobile device market. This market grew by 53 per cent (devices shipped) in 2007. The top three device vendors worldwide in 2007 were Nokia, RIM and Apple.

Say what? Yes, believe it or not the iPhone vaulted Apple into Number-Three spot, just ahead of Motorola. Looking at just the North American market, the picture looks even rosier for Apple. Canalys estimates that in Q4 2007, Apple was in Number-Two spot with 28 per cent market share in the US, behind Number-One RIM at 41 per cent but ahead of Palm at nine per cent. Apple even beat out the combined market share of the multiple vendors that use Windows Mobile (21 per cent combined share).

Interestingly, while handheld computing was dominated by Windows and Palm operating systems and Psion and its Symbian OS mainly in Europe, the smartphone hierarchy has Symbian as the dominant smartphone OS worldwide with 65 per cent market share, with Windows (12 per cent) and RIM (11 per cent) far behind in second and third spots. But looking at just North America (US primarily), a far different picture emerges with RIM OS in top spot (42 per cent) followed by Apple (27 per cent) and Microsoft (21 per cent).

While there are a few reasons for RIM's success, the defining Blackberry feature was push email. Extending that lifeblood of corporate existence to everyone's pocket assured RIM's success even before the phone features were added. RIM's brilliant UI innovation was the thumb keyboard — just functional enough to get the essential job of email done. You wouldn't want to type a novel on it, but so what? Even at 20 words per minute, getting through a dozen emails while sitting anywhere is a real task accomplished.

The defining iPhone feature is iPod — not the device per se, but the ecosystem that has grown around it, part discrete device, part music store, part Internet experience. The ecosystem creates the experience and expectation that iPhone responds to, in the same way that Blackberry responds to the corporate need to be constantly connected to the information flow that's the main currency of the knowledge worker. Phone and Wi-Fi are inevitable extensions within that ecosystem.

UI brilliance? I'll have to wait until I actually try one to make my own judgement, but it looks fun and functional.

Interestingly, one of Intel's target platforms for its Atom processor is the MID or mobile Internet device. If you've been witnessing how quickly Apple gobbles up new Intel technology and spins them into its computer lines, you shouldn't be too surprised if an Atom processor found its way into a future iPhone. Now there will be an ultra mobile to behold.

Until next time,  
David Tanaka



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